DRAFT FOR PUBLIC COMMENT

WATER QUALITY MASTER PLAN

TETON COUNTY, WYOMING

November 15, 2023

Project #: 00803-003-0010

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

Table of Contents

EXECUTIVE SUMMARY i
Introduction i
Planning Process ii
Current Water Quality Initiatives ii
Water Resources Assessment ii
Recommended Water Quality Actions iii
Governance iii
Action Plan iv

1.0 INTRODUCTION 1-1
1.1 Background 1-1
1.2 Plan Overview 1-1
1.3 Guiding Principles from the Comprehensive Plan 1-2

2.0 PLANNING PROCESS 2-1
2.1 Project Partners 2-1
2.2 Stakeholder Groups 2-1
2.3 Public Meetings 2-2
2.4 Stakeholder Meetings 2-2
2.5 Public Comment 2-3
2.6 Public Education 2-3

3.0 CURRENT WATER QUALITY INITIATIVES 3-1
3.1 Flat Creek Watershed Management Plan (WMP) Implementation 3-1
3.2 Town of Jackson Surface Water Drainage Infrastructure Master Plan 3-1
3.3 Fish Creek Watershed Management Plan 3-2
3.4 Hoback Junction Area Nitrate Investigation 3-2
3.5 Water Quality Monitoring 3-2
3.6 Jackson Hole Airport PFAS Investigation 3-3
3.7 Other Initiatives 3-3

4.0 WATER RESOURCES ASSESSMENT 4-1
4.1 Volume I – Introduction 4-1

Table of Contents (cont.)

4.2 Volume II – Wastewater 4-1
4.3 Volume III – Stormwater, Nonpoint, & Point Sources 4-1
4.4 Volume IV – Wildlife and Recreation 4-1
4.5 Volume V – Drinking Water 4-2
4.6 Volume VI – Water Resources Sensitivity and Vulnerability Analysis (WRSVA) 4-2
4.7 Volume VII – Future Considerations 4-2

5.0 RECOMMENDED WATER QUALITY ACTIONS 5-1
5.1 Additional Studies 5-1
5.2 Education 5-2
5.3 Land Development Regulation Amendments 5-3
5.3.1 Planning Overlay 5-3
5.3.2 Priority Areas for Wastewater Collection and Treatment 5-3
5.4 Small Wastewater Facility Regulation Amendments 5-4
5.5 Monitoring 5-4
5.6 Governance and Policy 5-4
5.7 Mitigation Measures 5-5

6.0 GOVERNANCE 6-1
6.1 Measuring Success 6-2

7.0 ACTION PLAN 7-1
7.1 Essential Actions (2024 – 2025) 7-1
7.2 Immediate Actions (2024 – 2026) 7-1
7.3 Short-term Actions (2024 – 2029) 7-2
7.4 Long-term Actions (2024 – 2044) 7-3
7.5 Other Actions 7-3
7.6 Funding 7-3

8.0 REFERENCES 8-1

List of Tables

5-1. Additional Studies

5-2. Education Initiatives

5-3. Governance

5-4. Immediate Mitigation Measures

5-5. Contingent Immediate Mitigation Measures

5-6. Short-Term Mitigation Measures

5-7. Long-Term Mitigation Measures

5-8. Other Mitigation Measures

7-1. Immediate Actions

7-2. Short-Term Actions

7-3. Long-Term Actions

7-4. Other Actions

List of Figures

3-1. Hard Copy Report and Electronic Water Quality Data Timeline

4-1. Sanitary Sewer Lines and Wastewater Treatment Facilities

4-2. Nonpoint Source Stormwater Discharge

4-3. Point Sources

4-4. WDEQ Storage Tank Program Facilities

4-5. Teton County Public Water Systems

4-6. Aquifer Vulnerability

4-7. Surface Water Vulnerability

List of Appendices

A. PUBLIC ENGAGEMENT

A-1. WASTEWATER STAKEHOLDER GROUP

A-2. DRINKING WATER STAKEHOLDER GROUP

A-3. NONPOINT SOURCE/STORMWATER STAKEHOLDER GROUP

A-4. WILDLIFE AND RECREATION STAKEHOLDER GROUP

A-5. COOPERATING AGENCIES STAKEHOLDER GROUP

A-6. PLACEHOLDER

B. CURRENT INITIATIVES

B-1. DATA SUMMARY TECHNICAL MEMORANDUM

B-2. EXISTING FLAT CREEK WATERSHED MANAGEMENT PLAN INITIATIVES

B-3. EXISTING TOWN OF JACKSON INITIATIVES

B-4. PLACEHOLDER

B-5. EXISTING SNAKE RIVER FUND INITIATIVES

C. WATER RESOURCES ASSESSMENT

C-1. VOLUME I – INTRODUCTION

C-2. VOLUME II – WASTEWATER

C-3. VOLUME III – STORMWATER, NONPOINT, AND POINT SOURCES

C-4 VOLUME IV – WILDLIFE AND RECREATION

C-5 VOLUME V – DRINKING WATER

C-6 VOLUME VI – WATER RESOURCES SENSITIVITY AND VULNERABILITY ASSESSMENT

C-7 VOLUME VII – FUTURE CONSIDERATIONS

List of Appendices (cont.)

D. LAND DEVELOPMENT REGULATIONS

D-1. EVALUATION OF SUGGESTED AMENDMENTS TO LAND DEVELOPMENT REGULATIONS

D-2. RECOMMENDED AMENDMENTS TO LAND DEVELOPMENT REGULATIONS

E. OVERLAYS

E-1. WATER QUALITY PROTECTION OVERLAY

E-2. WASTEWATER TREATMENT PRIORITY OVERLAYS

F. SMALL WASTEWATER FACILITY REGULATION AMENDMENTS

G. MONITORING FRAMEWORK

H. MITIGATION MEASURES

H-1. MITIGATION MEASURE EVALUATION EXPLANATION

H-2. SOURCE WATER PROTECTION PLANNING

H-3. CONSTRUCT RV DUMP STATION

H-4. COUNTY OWNERSHIP OF SEWER EXTENSIONS

H-5. DEVELOP AQUIFER PROTECTION OVERLAYS (APOS)

H-6. IMPLEMENT RECOMMENDATIONS FROM OTHER PLANS

H-7. BIOSOLIDS REUSE/DISPOSAL

H-8. IMPLEMENT FISH CREEK WATERSHED MANAGEMENT PLAN

H-9. IMPLEMENT TOWN OF JACKSON STORMWATER MANAGEMENT PROGRAM

H-10. UPGRADE EXISTING LARGE WATER & WASTEWATER TREATMENT PLANTS

H-11. CONTINUE IMPLEMENTATION OF IN-LINE STORMWATER TREATMENT OR GREEN INFRASTRUCTURE IN TOWN

H-12. ESTABLISH TOTAL MAXIMUM DAILY LOADS (TMDLS)

H-13. STREAMBANK STABILIZATION/RESTORATION PROJECTS

List of Appendices (cont.)

H-14. IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) AT RIPARIAN AREAS

H-15. CONSTRUCT WETLANDS TO TREAT IRRIGATION RETURN FLOWS

H-16. CONSTRUCT VAULT TOILETS AT TRAILHEADS & RIVER ACCESS SITES

H-17. CREATE WATER QUALITY BEST MANAGEMENT PRACTICE (BMP) GUIDANCE DOCUMENTS

H-18. STORMWATER TREATMENT UNIT SLUDGE DISPOSAL

H-19. ESTABLISH ILLICIT DISCHARGE PROGRAM

H-20. CONSTRUCT PUBLIC WATER SYSTEMS IN COUNTY

H-21. EXPAND EXISTING SEWER DISTRICTS

H-22. CREATE NEW WATER & SEWER DISTRICTS (WSD) FOR REMOTE/FUTURE SUBDIVISIONS

H-23. PRIORITIZE WATER AND SEWER DISTRICT FORMATION COUNTYWIDE

H-24. PUBLIC WATER DELIVERY

H-25. INCREASE BANK SHADING ALONG STREAMS

H-26. FLAT CREEK SEDIMENT REDUCTION PROJECT

H-27. EXPEDITE REMEDIATION OF SITES NOT ACTIVELY REMEDIATING

H-28. CONSERVE/CREATE NEW WETLANDS

H-29. ACQUIRE INSTREAM FLOW WATER RIGHTS

H-30. REDIRECT WILSON SEWER DISTRICT FLOW

H-31. CREATE COUNTYWIDE WATER AND SEWER DISTRICT

H-32. STORMWATER COLLECTION AND TREATMENT COUNTYWIDE

H-33. CONTINUING EDUCATION COURSES

EXECUTIVE SUMMARY

INTRODUCTION

The Teton County Water Quality Master Plan (WQMP) is a countywide water quality protection plan intended to address the common values and goals presented in the *Jackson/Teton County Comprehensive Plan* (Jackson, Teton County, 2020). The WQMP is a local land use plan developed by Teton County (County), in collaboration with the Town of Jackson (Town), Teton Conservation District (TCD), and Protect Our Water Jackson Hole (POWJH), under Wyoming statutory authority and incorporating elements of source water protection from the Wyoming Department of Environmental Quality (WDEQ) as well as the federal Clean Water Act (CWA) and Safe Drinking Water Act (SDWA).

County residents value the local water resources that comprise the drinking water supply, support abundant wildlife, and provide diverse recreational opportunities. The 23,331 residents of the County (U.S. Census Bureau, 2022a) rely on drinking water supplied solely from groundwater resources. The lakes, rivers, streams, and wetlands support the habitat of elk, moose, mule deer, bears, cutthroat trout, trumpeter swans and bald eagles, to name a few highly valued species of the area, as well as offer recreational opportunities to residents and visitors. It is no surprise that County residents prioritize protection of their water resources to maintain the incredible quality of life in the region.

At the County level, regulatory protection of water resources is primarily achieved through the land-use standards in the *Teton County Land Development Regulations* (LDRs) and the *Title 9 Small Wastewater Facility Regulations* (SWFRs). The LDRs are the County's zoning and subdivision regulations and are intended to promote the health, safety, and general welfare of the present and future residents of the unincorporated areas of the County. The SWFRs are a permitting authority delegated by the WDEQ to the County and limited to small wastewater facilities with design flows less than 2000 gallons of domestic sewage per day, and publicly owned or controlled sewage collection. Non-regulatory protection of water resources is achieved through educational initiatives, water quality research and protection initiatives, and well-planned and designed water supply and wastewater treatment infrastructure.

Therefore, the objective of the WQMP is to identify and evaluate water quality actions that can be effectively implemented through the statutory authorities of the County, as well as the ongoing research, outreach, and prevention completed by the Town, TCD, POWJH, and many other collaborating agencies and organizations.

PLANNING PROCESS

The WQMP project was initiated in January 2022 and is funded jointly by the County, TCD, and POWJH. While the Town is not a funding partner, the Town is considered a project partner as their wastewater, stormwater, drinking water, and transportation infrastructure plays an important role when evaluating water quality within the county. The project partners, along with Trihydro and Flitner Strategies, Inc., are members of the project team and worked closely together throughout the development of this WQMP. In addition, five stakeholder groups consisting of individual community members with expertise and interest in specific water quality issues provided input to the project team during the planning process.

To meet the objective of identifying effective water quality actions, the project team took the following steps:

- Current water quality research initiatives were compiled and their data was used to assess current water resource conditions.
- Water resources were then assessed for current and future sensitivity and vulnerability to identify likely sources of water quality threats and the areas most in need of protection.
- The project team, stakeholder groups, and members of the public suggested potential water quality actions that were thoroughly evaluated using detailed criteria. The water quality actions include additional studies, education initiatives, governance/policy, amendments to the LDRs and SWFRs, a monitoring program, and structural mitigation measures.

CURRENT WATER QUALITY INITIATIVES

Local, state, and federal agencies and organizations contribute to a large body of water quality research and protection initiatives in Teton County. Data collected by the County, Town, TCD, WDEQ, the U.S. Geological Survey (USGS), among other agencies, provide the basis for the water quality assessments presented in this WQMP. Additionally, past resource management plans and new plans under development by the Town, County, TCD and WDEQ provide ongoing water quality protection strategies and actions. Other educational and advocacy initiatives are in place thanks to the leadership of organizations such as POWJH, Jackson Hole Clean Water Coalition (CWC), Trout Unlimited, the Snake River Fund, and Providing Animal Welfare Services (PAWS) of Jackson Hole.

WATER RESOURCES ASSESSMENT

Existing water quality research and protection initiatives were compiled, reviewed, and presented in this WQMP. The detailed assessment includes:

- An evaluation of past and current efforts to protect water resources.
- Water resource characteristics including drinking water, irrigation, wildlife, and recreational uses.
- Contaminant sources that pose a threat to water quality including nonpoint and point sources.
- Water resource sensitivity and vulnerability analysis.
- Future influences on water resources, such as climate change, ongoing development, emerging contaminants, and regulatory changes.

The water resource assessments are used to identify sources of potential contaminants and zones of concern in the County so that targeted, effective water quality actions can be implemented to protect and improve water resources.

RECOMMENDED WATER QUALITY ACTIONS

Water quality actions that strengthen water resource protection were proposed by the project team, stakeholders, and members of the public. Non-regulatory actions include promoting public education initiatives; implementing a countywide water quality sampling plan; and conducting additional studies to further characterize water resources, contaminant sources, and existing infrastructure more fully. Regulatory actions include amendments to the SWFRs to strengthen operational requirements and to the LDRs to add a Water Quality Protection Overlay and associated standards, among other proposed amendments. Other regulatory actions include connecting priority areas to wastewater collection and treatment systems when feasible and creating a Water Quality Advisory Committee to oversee and assist in the implementation of the WQMP. Mitigation measures, or capital projects, were evaluated and recommended based on criteria included in a detailed evaluation form..

GOVERNANCE

The County will be the lead authority in implementing the WQMP and plans to hire a Water Resources Program Manager (WRP Manager) to undertake the proposed actions in the WQMP. Continued coordination and collaboration with local agencies and non-governmental organizations (NGOs) is critical to ensure successful implementation of the WQMP. Creation of a Water Quality Advisory Committee (WQAC) comprised of members of the Town, County, TCD, other agencies/organizations, and members-at-large (residing in both the Town and County) is recommended to assist the WRP Manager in overall implementation of the WQMP.

As implementation of the WQMP progresses, the County may consider forming a Regional Water Quality Organization (RWQO), similar to a Regional Transportation Planning Organization, that may better serve the citizens of the County. The RWQO would undertake water quality planning for the Town and County and provide coordination

between local, regional, state, and federal water quality programs, as well as be eligible to accept local, state, Federal, and private grants and enter contracts.

ACTION PLAN

The action plan is where the real work begins in fulfilling the goals of the WQMP and is summarized below.

- Essential actions are key to moving the WQMP forward during the first year (2024 to 2025).
  - Teton County Board of County Commissioners (BOCC) adopts this WQMP.
  - Fill the Sanitarian and WRP Manager positions and hire 2 additional FTE to assist the WRP Manager.
  - Select subcontracting resources where needed.
  - Establish and appoint members to the WQAC.
- Immediate actions include high priority, effective actions to get started in the first two years (2024-2026).
  - Additional Studies: conduct additional studies to evaluate the Wastewater Treatment Plant (WWTP) lagoons, more fully characterize water resources, and inventory SWFs, snow storage areas, stormwater sources, and wastewater treatment capabilities.
  - Education: launch educational initiatives to gain support for the actions proposed in the WQMP and to promote prevention of contaminant migration by developers and homeowners.
  - LDRs: amend the regulations to include a Water Quality Protection Overlay (WQPO) and associated land-use standards and best management practices (BMPs).
  - SWFRs: amend Title 9 to add operating permits, certified service providers, and treatment standards or sewer connection in the WQPO.
  - Monitoring: implement a countywide water quality monitoring program to fully characterize water resources over a continuous time.
  - Governance: create WQMP implementation teams and formalize a sewer connection program for new construction and SWF replacement, including County ownership of sewer extensions.
  - Mitigation Measures: implement actions in other plans, such as the Town Stormwater Plan and Fish Creek Water Management Plan (WMP), conduct additional source water protection planning, build an RV dump station, and create a biosolids reuse/disposal system.

- Short-term actions include moderate priority, effective actions to get started in the first five years (2024-2029).
  - Additional Studies: create an operational database inventory of water and wastewater infrastructure and evaluate treatment/reuse options for stormwater, grey water, and reclaimed wastewater.
  - Education: initiate programs to instruct homeowners and the agricultural community about BMPs for riparian habitats and promote voluntary water supply testing of Public Supply Wells (PWS) and private wells.
  - LDRs: implement the WQPO and water quality BMPs and establish surface water quality Total Maximum Daily Loads (TMDLs).
  - SWFRs: implement operating permits, create certification program for service providers, and pursue sewer connection for new construction and SWF replacement.
  - Monitoring: amend water quality sampling schedule and parameters as needed and continue program.
  - Governance: require PWS to report Consumer Confidence Reports (CCRs) to the County and establish a program to prevent illicit discharges.
  - Mitigation Measures: construct vault toilets at trailheads and river access points, streambank stabilization/restoration, wetlands for irrigation return flows, and sludge disposal treatment units.
- Long-term actions include lower priority, effective actions to conduct in the first twenty years (2024-2044).
  - Additional Studies: evaluate wetland banking challenges.
  - Education: promote water conservation and reuse BMPs.
  - LDRs: implement TMDLs and the WQPO.
  - SWFRs: continue to implement operational permits and the certified service provider program and pursue sewer connection for new construction and SWF replacement.
  - Monitoring: continue program and amend sampling schedule and parameters as needed.
  - Governance: create a stormwater utility, a responsible management entity (RME) for SWFs, and establish water conservation goals.
  - Mitigation Measures: create new water and sewer districts and expand existing districts and construct associated infrastructure.

1.0 INTRODUCTION

Teton County, Wyoming is a growing community with exceptional water resources. The County prioritizes ecosystem stewardship, responsible growth management, and quality of life as the three common values outlined in the *Jackson/Teton County Comprehensive Plan* (Town of Jackson, Teton County, 2020). Detailed water quality management planning is desired to achieve the common values and goals outlined in the Comprehensive Plan and to adhere to the goals and objectives of the CWA and SDWA.

1.1 BACKGROUND

Surface and ground water quality has become an increased focus in Teton County. Recent water quality issues have raised concerns within the community. Examples include elevated nitrate levels in Hoback Junction, WY groundwater, which exceed drinking water standards; and the current impairment of Fish and Flat Creeks where Escherichia coli (*E. coli*) concentrations exceeded recreational contact standards based on data obtained in 2017 by the WDEQ (WDEQ 2020).

Many water quality protection efforts have successfully been undertaken and implemented by Teton County, the Town of Jackson (Town), and the Teton Conservation District (TCD). However, the community currently lacks a holistic management plan to address water quality protection. Most of the past and current initiatives have been executed outside of an overall strategic approach. Teton County selected Trihydro Corporation (Trihydro) to assist with developing a countywide Water Quality Master Plan (WQMP) in 2021. This planning effort is primarily focused on private lands within Teton County, but there were instances where water quality on Federal lands was evaluated. Trihydro teamed with Flitner Strategies, Inc. to support public involvement activities associated with the WQMP.

1.2 PLAN OVERVIEW

The WQMP is a collaborative product among the County, Town, TCD, and POWJH and includes input from five stakeholder groups and members of the public (see Section 2.0). Per Wyoming Statute 18-5-201, the County has the authority to "…regulate and restrict the location and use of building and structures and the use, condition or use or occupancy of lands for residence, recreation, agricultural, industry, commerce, public use and other purposes in the unincorporated area of the county." As such, this Plan provides guidance for the protection of water resources within the parameters of the County's authority.

First, past and current water quality initiatives that complement the WQMP are presented in Section 3.0. Next, the WQMP includes the Water Resources Assessment (WRA), presented in Section 4.0. The WRA was prepared as part of

the WQMP and provides background information on impacts to water quality from wastewater, stormwater, and nonpoint-, and point-sources, as well as wildlife and recreational sources. The WRA also evaluates the sensitivity and vulnerability of groundwater and surface water; and discusses potential future impacts to water quality.

Based on the information presented in the WRA, the stakeholder groups and the project team suggested water quality actions (WQAs) that include additional studies, education initiatives, governance/policy, amendments to the LDRs and SWFRs, comprehensive monitoring, and mitigation measures, all of which are presented in Section 5.0. The mitigation measures are thoroughly assessed and presented in Section 5.7.

Section 6.0 discusses how the WQMP will be implemented and identifies entities responsible for implementation; how implementation will be monitored, and success measured; and, how the WQMP will adapt as future needs are identified or water quality conditions change. An action plan is presented in Section 7.0. The Action Plan includes essential, immediate, short-term, and long-term actions.

1.3 GUIDING PRINCIPLES FROM THE COMPREHENSIVE PLAN

Development of the WQMP will help the County achieve the values and goals outlined in the 2020 Jackson/Teton County Comprehensive Plan (Comprehensive Plan), which established that the preservation and protection of the ecosystem is at the core of Jackson and Teton County's character. The Comprehensive Plan created a vision to live sustainably in an ever-changing ecosystem and community and identified the Common Values of Jackson Hole as ecosystem stewardship, growth management, and quality of life. Principle 1.2 of the Comprehensive Plan is to preserve and enhance surface water and groundwater quality through four distinct measures, as clean water is the most basic requirement for a healthy ecosystem and community. In the interest of ecosystem and community health, the Town and County will buffer waterbodies, wetlands, and riparian areas from development; require filtration of runoff; coordinate water quality monitoring with TCD and other partners; and protect the Snake River Sole Source Aquifer. The strategies identified in the Comprehensive Plan to accomplish these measures include:

- Evaluating and updating natural resource protection standards for waterbodies, wetlands, and riparian areas.
- Evaluating and updating surface water filtration standards.
- Developing a water quality enhancement plan that includes consideration of Town, County, TCD, and other partnerships.
- Implementing and updating the Flat Creek Watershed Management Plan.
- Investigating updates to the Land Development Regulations and Small Wastewater Facility Regulations.

- Enhancing existing water quality protection tools and exploring the development of new tools.
- Educating the community about the importance of water quality protection and the sole source aquifer.
- Encouraging and supporting public water suppliers in establishing or updating source water assessments and protection plans.

2.0 PLANNING PROCESS

Since the WQMP project was initiated in January 2022, many entities have been involved in the process. This section identifies project partners, stakeholder groups, public meetings, stakeholder meetings, public comment process, and public education activities.

2.1 PROJECT PARTNERS

Four organizations serve as project partners in the WQMP planning process. Teton County, TCD, and Protect Our Water Jackson Hole (POWJH) were funding partners. While the Town of Jackson was not a funding partner, the Town was considered a project partner as their wastewater, stormwater, drinking water, and transportation infrastructure plays an important role when evaluating water quality within the county. Teton County provided the largest portion of project funding and managed the WQMP project on behalf of the project partners. The project partners, along with Trihydro and Flitner Strategies, Inc., were members of the Project Team and worked closely together throughout the planning process.

2.2 STAKEHOLDER GROUPS

Five stakeholder groups consisting of individual community members with expertise and interest in specific water quality issues were created to provide input to the Project Team during the planning process. The five stakeholder groups included:

- Wastewater
- Drinking Water
- Nonpoint Source/Stormwater
- Wildlife and Recreation
- Cooperating Agencies

The Project Team identified and invited 134 potential stakeholders to participate throughout the planning process, with 31, 27, 25, 24, and 17 individuals invited to participate in the Wastewater, Stormwater, Wildlife and Recreation, Drinking Water, and Cooperating Agency stakeholder groups, respectively. The list of stakeholders can be found in Appendices A-1 through A-5. The list of stakeholders also notes in which meetings each stakeholder participated. Names that do not have an organization associated with them attended the meeting as a member of the public.

2.3 PUBLIC MEETINGS

Public engagement is an integral component of the planning process to solicit and receive feedback from the public. Early in the project, the first meeting was held on May 5, 2022, at the Teton County Library. Interested community members attended the meeting in person and virtually and a list of attendees based on stakeholder groups can be found in Appendices A-1 through A-5. Trihydro presented an overview of the project, including the history of water quality in Teton County; current issues and areas of focus; project budget and schedule; funding opportunities; and regulatory framework. Also presented was an overview of the development of sensitivity and vulnerability analysis.

A second public meeting was held on November 15, 2023 to kick off the Draft WQMP public comment period. To be completed after the public meeting. Appendix A-6 is a placeholder.

Finally, an open house was held on December 13, 2023 to receive input on the WQMP during the public comment period. To be completed after the public meeting. Appendix A-6 is included as a placeholder for public comments.

2.4 STAKEHOLDER MEETINGS

Numerous stakeholder meetings were held to present information specific to each area of focus addressed in the Water Resources Assessment with each stakeholder group. Meetings were not limited to stakeholders and project team members as members of the public could attend and participate if they wished.

The first stakeholder meeting included attendees from all five stakeholder groups and was held in the Town of Jackson Council Chambers and virtually on October 20, 2023.

In January and February 2023, stakeholder meetings were held virtually with each stakeholder group. Meetings with the Drinking Water, Wastewater, Wildlife & Recreation, Stormwater, Nonpoint, and Point Sources, as well as a meeting with Cooperating Agencies, were held on January 24, 25, 25, 26, and February 15, 2023, respectively. The purpose of the meetings was to present information compiled by Trihydro during the preparation of the Water Resources Assessment, answer questions and receive feedback from stakeholder group members. Attendees for each stakeholder group meeting are provided in Appendices A-1 through A-5.

In March 2023, stakeholder meetings were held virtually with all stakeholder groups except the Cooperating Agency stakeholder group. Meetings with the Wastewater; Stormwater, Nonpoint, and Point Sources; Wildlife & Recreation; and, Drinking Water were held on March 23, 22, 23, and 23, 2023, respectively. During the meetings, the Trihydro team provided updates on the Water Resources Assessment and much of the time was committed for breakout groups

to discuss water quality concerns and provide suggestions for potential mitigation measures. Attendees of each stakeholder group meeting are provided in Appendices A-1 through A-5.

Each stakeholder group member received a copy of the Water Resources Assessment volume applicable to their stakeholder group for review and comment. Volumes I through V were sent to respective stakeholder groups on May 15, 2023 or May 16, 2023 and Volume VI was provided on May 30, 2023. Comments were provided to Trihydro by stakeholders through the end of June. Attendees of each stakeholder group meeting are provided in Appendices A-1 through A-5.

A final stakeholder meeting with all stakeholder groups was held on August 29, 2023, at the Teton County Library and virtually. The purpose of the meeting was to provide an update to stakeholders, as well as solicit input from each stakeholder regarding their top three priorities for each Water Quality Action group. Input received from stakeholders was tabulated and incorporated into Trihydro's evaluation for each WQA. Results of stakeholder voting are provided in Section 6.0. Attendees of each stakeholder group meeting are provided in Appendices A-1 through A-5.

2.5 PUBLIC COMMENT

At the start of the WQMP process, a public engagement website was created on Teton County's Engage Teton County website for the WQMP (Teton County Water Quality Master Plan – Public Input (engagetetoncountywy.com). Project documents were shared on the website and the public could submit comments throughout the planning process. Public comment on the draft WQMP will also be submitted via the Engage Teton County WQMP website.

A public comment period was held from November 15, 2023 to December 31, 2023 to provide the public an opportunity to provide comments on the Draft WQMP. An advertisement was printed and published in the *Jackson Hole News & Guide* and emails were sent via the Public Input website. This section will be finalized after the public comment period. Comments will be summarized and included in Appendix A-6.

2.6 PUBLIC EDUCATION

Trihydro prepared five informational brochures/posters, which were distributed to the public:

- A Septic System Homeowner Guide and Care.
- Stormwater Management Guide for Construction Sites.

- Lawn Care Management Guide.
- Pet Waste.
- Pond Management Guide.

3.0 CURRENT WATER QUALITY INITIATIVES

Many water quality characterization, data collection, and protection efforts have successfully been undertaken and implemented on the local, state, and Federal levels and are presented in Figure 3-1 and Appendix B-1. The results of these efforts and their data are referenced throughout the WRA volumes and are included in Appendix C of this report. This section focuses on the current ongoing initiatives underway by the Town of Jackson, Teton County, TCD, The United States Geological Survey (USGS), the WDEQ, and several other organizations. The following sections highlight major initiatives undertaken by various groups throughout Teton County.

3.1 FLAT CREEK WATERSHED MANAGEMENT PLAN (WMP) IMPLEMENTATION

WDEQ completed an assessment of Flat Creek in 1996 and found that the state's designated beneficial use for aquatic life and cold-water fisheries was threatened due to sediment loading from urban stormwater runoff, which was confirmed by further water and habitat monitoring by the TCD and Town of Jackson (Girard et al 2019). Segments of Flat Creek have been listed as threatened or impaired since 2002 (Trihydro 2023). As a result of the listing, the TCD spearheaded the preparation of the *"Flat Creek Watershed Management Plan,"* which was drafted in 2006. The WMP was prepared in lieu of establishing a WDEQ total maximum daily load (TMDL) for pollutants. Since the initial WMP was prepared in 2006, many of the proposed practices and policies identified in the 2006 WMP were adopted, and an update to the 2006 WMP was prepared in 2019. The 2019 version of the WMP set additional goals and identified structural management practices, non-structural management practices, and administrative and monitoring recommendations, all of which are currently being implemented to this day. The practices identified in the 2019 WMP are provided as Appendix B-2.

3.2 TOWN OF JACKSON SURFACE WATER DRAINAGE INFRASTRUCTURE MASTER PLAN

The Town of Jackson is currently preparing an update to the Town's 2001 "*Surface Water Drainage Infrastructure Master Plan"* (SWDI Master Plan). Progress made towards implementing the 2001 SWDI Master Plan is provided in Appendix B-3. The update, the forthcoming Town of Jackson Stormwater Management Program (SMP), will include a refreshed capital improvements plan, recommendations for illicit discharge detection and elimination; a stormwater rainfall/runoff/pollutant model; construction erosion and sediment control recommendations; post-construction stormwater quality recommendations; evaluation of an incentive program to encourage "beyond minimum" best management practices; updates to existing water quality monitoring programs; updates to Town ordinances; preparation of stormwater manuals; development of a public education strategy; and, evaluation of funding options. Appendix B-3 should be updated to incorporate recommendations set forth in the forthcoming SMP.

3.3 FISH CREEK WATERSHED MANAGEMENT PLAN

Fish Creek was designated as impaired for recreational contact use by WDEQ in 2020 as E. coli levels exceeded the recreational contact standard of 126 colony-forming units per 100 mL (CFU/100 mL). TCD is currently leading the effort to prepare the *Fish Creek Watershed Management Plan* rather than establish Total Maximum Daily Loads (TMDLs) for the Fish Creek watershed. The *Fish Creek Watershed Management Plan* requires approval by WDEQ to determine if they will accept the *Fish Creek Watershed Management Plan* as a TMDL alternative or if WDEQ will implement a TMDL. Additionally, it is likely that Fish Creek will be listed as nutrient impaired in WDEQ's forthcoming 2024 Integrated 303(b) and 303(d) report to the USEPA. If designated as nutrient impaired, the *Fish Creek Watershed Management Plan* will need to address nutrient sources. Trihydro recommends assessing the contribution of geologic nutrient sources as part of the *Fish Creek Watershed Management Plan* update. Appendix B-4 was reserved to incorporate recommended actions identified in the *Fish Creek Watershed Management Plan*.

3.4 HOBACK JUNCTION AREA NITRATE INVESTIGATION

WDEQ is currently assessing the cause of groundwater contamination in the Hoback Junction area. Preparation of a conceptual site model report regarding Hoback nitrate contamination sources is underway. The anticipated issue date of the report for the pending study is unknown currently. A review and corresponding analysis will need to be incorporated into the WQMP at a later date.

3.5 WATER QUALITY MONITORING

The USGS and TCD have ongoing water quality monitoring efforts planned for the next several years. The USGS presently operates, maintains, and collects data from continuously operating stream gages at 15 sites in Teton County. Ten of the sites measure discharge and water temperature continuously. Three sites only collect discharge measurements. Discharge, water temperature, and turbidity data are collected at a site located on Flat Creek below the confluence with Cache Creek. Continuous discharge, water temperature, specific conductivity, pH, and dissolved oxygen data are collected from the Snake River at Moose. The USGS is not currently collecting groundwater quality data. Future water quality data collection efforts include collecting pesticide data, along with some nutrient data, at groundwater and surface water sites through Teton County (Miller 2023).

TCD's current monitoring efforts, as shared by TCD, include (Lee 2023):

- Flat Creek
    - Suspended sediment concentration and turbidity four times per year between the months of May and November.

    - Surface water chemistry once per year at six monitoring sites.
    - Macroinvertebrates once per year at six monitoring sites.
    - Physical Substrate, or pebble counts, once per year at six monitoring sites.
- Fish Creek is currently not being monitored. Monitoring will likely resume in 2024 pending WDEQ approval of sampling parameters and frequency.
- No groundwater chemistry data are being collected, but water levels are being measured upon request at certain locations.
- Wyoming tributaries to the Teton River.
    - Friends of the Teton River collect field parameters in Teton River tributaries located in Wyoming.
- TCD also administers the voluntary Residential Well Test Kit program by selling well test kits, which include the following parameters: arsenic; chloride; fluoride; nitrate; nitrite; pH; sodium; sulfate; total coliform and *E. coli* bacteria; total dissolved solids; and, total hardness. Other parameters, such as lead, iron, and copper, can be added to a test kit for an additional fee. Standard test kits cost TCD $112 per kit. Teton County residents pay a fee of $50 for the basic test kit and the TCD pays the balance from funds received from Teton County property taxes (TCD 2023).

3.6 JACKSON HOLE AIRPORT PFAS INVESTIGATION

The Jackson Hole Airport has voluntarily been conducting soil and groundwater investigations for per- and poly-fluoroalkyl substances (PFAS) since 2020. Activities have included monitoring well installation; off-site water quality monitoring; conceptual site modeling; hydrogeologic modeling; preliminary remediation system design; and groundwater and soil monitoring. Groundwater monitoring is ongoing at select onsite and residential wells. Additional monitoring wells will be installed pending adoption of drinking water protection standards by the USEPA and WDEQ.

3.7 OTHER INITIATIVES

Many other organizations participate in efforts to protect water quality in Teton County.

- Providing Animal Welfare Services (PAWS) of Jackson Hole leads a pet waste cleanup program by installing mutt mitt stations throughout Teton County. There are over 75 mutt mitt stations in Teton County that serve over 10,000 dogs and their owners. To date, PAWS has distributed over 2.4 million free mutt mitts in the 25 stations PAWS manages in the Town of Jackson alone (PAWS 2023).

- Protect Our Water Jackson Hole (POWJH) is a strong advocate for protecting and restoring the surface waters and groundwater in Teton County. POWJH partners with the Town and County not only on the WQMP, but on many other water quality initiatives such as sustainable home and lawn care best practices and a review of the Town of Jackson wastewater treatment plant discharge to the Snake River.
- Jackson Hole Clean Water Coalition (CWC) leads an effort to encourage "Trout Friendly Lawns."
- Trout Unlimited works with local landowners, as well as local, state, and federal agencies, to stabilize streambanks and improve fish passage in waterways countywide.
- Snake River Fund is a strong community partner in the funding, communication, and implementation of stewardship projects in the Upper Snake River Watershed including water quality monitoring, streambank and connectivity restoration, and annual river clean-up initiatives. An example of the Snake River Fund's work includes the Flat Creek Blueway project to improve water quality. Projects or initiatives identified in the Flat Creek Blueway Project Report are provided in Appendix B-5.

4.0 WATER RESOURCES ASSESSMENT

Trihydro prepared a Water Resources Assessment (WRA) comprised of seven volumes. The WRA provides background information; evaluates impacts to water quality from wastewater, stormwater, nonpoint, point, wildlife, and recreational sources. The WRA also evaluates the sensitivity and vulnerability of groundwater and surface water and identifies potential future impacts to water quality.

4.1 VOLUME I – INTRODUCTION

Volume I of the WRA is included as Appendix C-1 and provides a general overview of prior and current water quality initiatives, discusses data quality considerations, summarizes water quality regulatory framework, and describes previous planning activities. It also provides an overview of Teton County's land ownership, population, climate, hydrology, geology, hydrogeology, Snake River Plain Sole Source Aquifer, potential pollution sources, and existing water quality.

4.2 VOLUME II – WASTEWATER

Volume II is included as Appendix C-2 and describes current wastewater treatment plants and small wastewater facilities located in Teton County and evaluates the impacts wastewater treatment facilities currently have, and will have, on water quality. Sanitary sewer lines, wastewater treatment facilities, and areas served by SWFs are shown on Figure 4-1.

4.3 VOLUME III – STORMWATER, NONPOINT, & POINT SOURCES

Current stormwater, point, and nonpoint source effects on surface and groundwater are evaluated in Volume III, which is provided as Appendix C-3. Sources include stormwater and snowmelt, nutrient sources, construction, mining, voluntary remediation program sites, solid waste facilities, and in-stream improvements. Areas with stormwater nonpoint source discharges present are shown on Figure 4-2; point sources are shown on Figure 4-3; and, WDEQ Storage Tank Program facilities are shown on Figure 4-4.

4.4 VOLUME IV – WILDLIFE AND RECREATION

Volume IV evaluates the impacts wildlife and recreation have, and will have, on water quality. Conversely, it also evaluates the impacts that water quality has on wildlife and recreational resources. Volume IV provides a summary of available water quality data and evaluation for streams and rivers, which are included in Appendix C-4. In Volume IV of the WRA, Figures 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, and 5-7 show the monitoring locations from which water quality data

were adequate for analysis of Fish Creek, Flat Creek, Cache Creek, the Snake River, Gros Ventre River, Granite Creek, and Pacific Creek, respectively. Also, Appendix A, B, C, D, E, F, and G of Volume IV of the WRA provide graphs of water quality parameters evaluated for Fish Creek, Flat Creek, Cache Creek, the Snake River, Gros Ventre River, Granite Creek, and Pacific Creek, respectively.

4.5 VOLUME V – DRINKING WATER

Groundwater is Teton County's primary source of drinking water. Volume V describes the hydrogeologic setting of the available aquifers and evaluates current drinking water conditions and potential pollution sources that may impact drinking water resources. Volume V, provided as Appendix C-5, identifies public water supplies; summarizes violations received by the PWSs in the last five years; describes threats to drinking water sources; and, identifies areas with drinking water concerns based on private well test kit data provided by TCD and reported water quality data submitted by Class V injection facility permit holder's to WDEQ's Underground Injection Control Division. PWSs in Teton County are shown in Figure 4-5.

4.6 VOLUME VI – WATER RESOURCES SENSITIVITY AND VULNERABILITY ANALYSIS (WRSVA)

Groundwater and surface water sensitivity and vulnerability were evaluated in Volume VI of the WRA. Sensitivity, or the potential for groundwater or surface water to be impacted based on natural conditions, analysis was conducted. Then a vulnerability, or the likelihood of groundwater or surface water to be impacted based on natural conditions and human sources, analysis was performed. A detailed explanation of the approach and methods used to develop groundwater and surface water sensitivity and vulnerability ratings is provided as Appendix C-6. Figure 4-6 presents the results of the groundwater vulnerability assessment and Figure 4-7 presents the results of the surface water vulnerability assessment. Results of the WRSVA were used to guide development of water quality actions presented later in this WQMP.

4.7 VOLUME VII – FUTURE CONSIDERATIONS

Volume VII addresses future considerations for water quality planning and is provided as Appendix C-7. Topics such as development density, increased visitation, climate change, wildfires, emerging contaminants, and regulatory changes are addressed.

5.0 RECOMMENDED WATER QUALITY ACTIONS

Several stakeholder meetings were conducted virtually in early 2023. During those stakeholder meetings, suggestions for mitigation measures were recorded and incorporated into the list of potential mitigation measures. Additionally, throughout the planning process, the project team, consisting of Teton County, Protect Our Water Jackson Hole, Teton Conservation District, Town of Jackson, Trihydro, and Flitner Strategies, identified potential mitigation measures, which were also included in the list of potential mitigation measures.

In June 2023, the compiled list of mitigation measures was evaluated. During that effort, it was apparent that not all of the suggestions were mitigation measures but were better classified into additional categories. The initial list of mitigation measures included over 130 ideas. After further evaluation, the list was refined to 111 ideas across seven categories. Based upon discussion among the project team, going forward, the project team opted to refer to mitigation measures as Water Quality Actions (WQA) and identified the following WQA categories:

- **Additional Studies** include additional studies needed to inform future regulatory changes, support ongoing regulatory enforcement, future land use planning, and future updates to the final WQMP.
- **Education** to inform the public of best practices and what they can do to improve water quality.
- **Governance/Policy** includes ideas that will require direction/approval from the Teton County Board of Commissioners and/or the Town of Jackson Town Council.
- **Land Development Regulations** includes ideas for modifications to the land development regulations.
- **Small Wastewater Facility Regulations (SWFRs)** includes ideas to amend the SWFRs.
- **Monitoring** includes ideas to create a systematic approach to monitoring water quality countywide via surface and groundwater monitoring networks to provide consistent background data and identify water quality changes over time.
- **Mitigation Measures** includes projects that are typically structural in nature (i.e., those which need to be constructed, operated, and maintained).

5.1 ADDITIONAL STUDIES

Stakeholders and the Project Team identified several additional studies that generally focus on fully characterizing surface water and groundwater resources, quantifying the relative threats posed by various contaminant sources, and creating an inventory of public and private infrastructure. The recommended studies were evaluated based on:

- Stakeholder votes - The number of stakeholders who identified the study as one of three of their top priorities.
- Need time frame - An identified time frame for the study (i.e., immediate, short-term, or long-term). Studies identified as immediate needs should be conducted within the next two years, short-term studies are recommended for the next five years, and long-term indicates the study should be completed over the next 20 years.
- Capacity impact - Represents an estimate of the impact the study will have on County staff. Trihydro assumed the studies will be conducted by consultants, but the County will need to assign a staff member to manage the project on the County's behalf. A low rating means that the study will require up to a quarter of a staff member's time; a moderate rating means the study will require up to half of a staff member's time; and, a high rating means it may require full time support from a County staff member. Additional County staff may be necessary for some recommendations.
- Implementation time frame - Provides an estimate of how long it will take to conduct the study. A low, moderate, or high rating means the study will take a year or less, one to three years, or over three years, respectively.
- Cost - An estimate of the cost to conduct the study. Costs were divided into five ranges (thousands (K) or millions (MM) of dollars) depicted by dollar signs and include:
  - $ $0 - $250K
  - $$ $250K – 500K
  - $$$ $500K – 750K
  - $$$$ $750K – $1MM
  - $$$$$ Over $1MM
- Agency involvement - Identifies the agency responsible for leading the study and agencies that could support the study.

Nineteen additional studies were identified, and Trihydro combined several recommended studies to reduce the number to eleven. Of the eleven studies, six are recommended to move forward immediately, three are recommended to be conducted in the next five years, one is recommended to occur over the next 20 years, and one is not recommended to move forward. The potential studies and Trihydro's recommendations are presented in Table 5-1.

5.2 EDUCATION

Stakeholders and the Project Team identified several educational initiatives that generally focus on preventing water quality degradation and implementing best management practices for contaminant sources. The potential educational

initiatives were compiled, voted on by stakeholders, and further evaluated by Trihydro. Two educational initiatives are already being implemented by local advocacy groups. There were seven, six, and two educational initiatives recommended as immediate, short-term, and long-term actions, respectively. The recommended educational initiatives are presented in Table 5-2.

5.3 LAND DEVELOPMENT REGULATION AMENDMENTS

Recommended amendments to the Land Development Regulations (LDRs) are provided in two memos found in Appendix D. The first memo, Appendix D-1, discusses the LDR amendments suggested by stakeholders and provides an implementation recommendation. The second memo, Appendix D-2, carries forward the recommended amendments and provides more specificity about the sections of the LDRs to amend. The proposed amendments include more rigorous stormwater/snowmelt management, the prohibition of new manmade ponds, reduced nutrient loading from agricultural lands and heavy fertilizer users, increasing native plant requirements, and requiring RV waste disposal at new campgrounds. However, the greatest protection of surface water and groundwater quality is derived from the development of a Water Quality Protection Overlay (WQPO) and its associated land-use standards, described below.

5.3.1 PLANNING OVERLAY

The proposed WQPO identifies areas with very high sensitivity and vulnerability for both surface water and groundwater, including areas of known water quality impacts and concerns. The memo found in Appendix E-1 describes the basis for the boundaries of the WQPO and the division of the overlay into Areas 1 and 2. The proposed regulations are most protective in Area 1 and have more stringent requirements. The proposed regulations for Area 2 are less protective than the requirements for Area 1 but more protective than land-use regulations outside the WQPO.

The most substantial proposed land-use regulation within the WQPO is to require, when feasible, new construction and locations with a failing SWF to connect to a sanitary sewer system. When connection to a sanitary sewer is not feasible, advanced treatment and enhanced treatment are recommended as a requirement within the WQPO Areas 1 and 2, respectively.

5.3.2 PRIORITY AREAS FOR WASTEWATER COLLECTION AND TREATMENT

As stated above, when feasible, new construction and development with failing SWFs located in the WQPO should pursue connection to a sanitary sewer system. The criteria for assessing feasibility are described in a memo found in Appendix E-2 and include the collection system capacity, among other critical considerations. The memo presents

areas currently served by the Aspens-Pines and Town WWTPs, which are considered priority areas to connect to centralized sewer or a decentralized package WWTP.

5.4 SMALL WASTEWATER FACILITY REGULATION AMENDMENTS

Several amendments are proposed to make the Small Wastewater Facility Regulations more protective of water quality. A memo describing the amendments and a proposed red line/strikeout of the regulations are found in Appendix F. The most significant recommended changes to the regulations include the creation of Operating Permits, for all new and existing SWFs, that require septic systems to be pumped and inspected a minimum of every three (3) years by a Certified Service Provider. Additionally, advanced treatment and enhanced treatment are proposed for new systems and in the replacement of failing systems within the WQPO Areas 1 and 2, respectively. The county should consider adding a Water Quality Project Manager position to oversee the expanded SWF requirements and to implement the Water Quality Monitoring Plan described in the following section.

5.5 MONITORING

Establishing a county-wide Water Quality Monitoring Plan is critical to evaluate background and baseline water quality characteristics, monitor the effectiveness of existing land-use standards, and assess the need for new land-use standards and/or abatement measures. The establishment of a countywide water quality monitoring program was recommended as early as 1978 during the preparation of the Teton County Water Quality Management Program (Ablondi 1978). Appendix G presents the framework for proposed groundwater and surface water monitoring locations, sampling parameters, and sampling schedule. The framework is provided as guidance during monitoring program design and preparation of a sampling and analysis plan.

5.6 GOVERNANCE AND POLICY

Stakeholders and the Project Team suggested several approaches to implementing policies, such as amendments to the SWFR and LDR, and forming new governance entities, such as a regional wastewater authority or a stormwater utility. Seven governance and policy suggestions were discussed and voted on by the Project Team and are presented in Table 5-3, of which several are included as recommendations in this report. Table 5-3 provides a description, stakeholder votes, implementation time frame, and Trihydro's recommendation for each governance/policy action.

While it was not recommended to create a Regional Wastewater Authority, Trihydro does recommend the Town and County cooperatively formalize how future wastewater connections will be managed. Currently, Article 7, Division 7.7.3 of the Teton County LDRs require connection to a public sanitary sewer system if a development is located within 500 feet of a sewer main and legal access is obtainable. The Town of Jackson has been willing to

connect additional customers and is willing to consider connecting future customers to the Town's wastewater system. Trihydro has provided recommendations for future County sewer connections to the Town's system as part of the WQMP under the understanding the Town and County will cooperatively develop a plan to ensure adequate treatment plant capacity is available for future County connections. Trihydro recommends the Town and County formally agree how connections recommended as part of this plan, as well as connections required in the County LDRs, will be prioritized and managed.

5.7 MITIGATION MEASURES

Trihydro evaluated 33 potential mitigation measures, which were suggested by Stakeholder Groups and the Project Team, using a detailed evaluation system that is presented in Appendix H. The detailed evaluation form used in assessing the 33 mitigation measures was vetted by the Project Team and includes the following primary criteria, which are further described in Appendix H-1.

- Project Description
- Trihydro Evaluation
  - Identified Need
  - Need Time Frame
  - Implementation
  - Effectiveness
  - Community Acceptance
  - Social Benefits
  - Economic Benefits
  - Sustainability
  - Life Cycle Costs
- Benefits
- Challenges
- Life Cycle Cost
- Coordination
- Capacity Impacts/Needs

- Stakeholder Votes
- Trihydro Recommendation
- Suggested Next Steps

Evaluation forms for each individual mitigation measure are found in Appendices H-2 through H-33.

Following the evaluation of the 33 mitigation measures, the selected mitigation measures were grouped as immediate, contingent immediate, short term, long term, and not recommended. These groupings are presented in Tables 5-4 through 5-8, which provide information for each mitigation measure, including the evaluation form (see Appendix H); description; rating; need time frame; stakeholder votes; implementation time frame; relative cost; staffing needs; recommendations; and, agency involvement.

Based on Trihydro's evaluation, the following mitigation measures are recommended as immediate needs:

- Source Water Protection Planning (SWPP) (Appendix H-2) – SWPP is recommended to move forward as an immediate need. Of the 116 PWSs identified in Volume V (Drinking Water) of the Water Resources Assessment, only 43 have delineated source water protection zones and only 3 public water supplies (PWS) have prepared SWPPs. WDEQ will be conducting a Source Water Assessment Project (SWAP) in 2024 and PWS can volunteer to participate. An outreach and public education campaign explaining the benefits of SWPP will be critical to convince PWS to participate in the upcoming WDEQ project, as it is voluntary, and no regulatory mechanism exists to require PWS participation. LDR updates recommended as part of this WQMP, if adopted, will place additional restrictions on Zone 1 and Zone 2 protection zones as described in Appendix D and Appendix E-2.
- Construct an RV Dump Station (Appendix H-3) – An RV Dump Station was identified as a short-term mitigation measure in early 2023. Teton County is moving forward with siting and preliminary engineering for a new RV Dump Station at the direction of the Teton County Board of County Commissioners (BOCC).
- County Ownership of Sewer Extensions (Appendix H-4) – Teton County has already had discussions regarding county ownership of sewer extensions specific to owning a sewer line along N. Highway 89 to serve the Elk Refuge Inn and Flat Creek Inn, as well as potentially taking ownership of the Munger Mountain Elementary School (MMES) sewer line. A proposal was submitted by Teton County for inclusion on the 2024 WDEQ Clean Water State Revolving Fund (CWSRF) Intended Use Plan (IUP) to construct a sewer extension along N. Highway 89. That project is currently ranked 20th on the 2024 CWSRF IUP. Trihydro has identified and prioritized areas within the unincorporated county that are recommended for wastewater collection and treatment as discussed in Section 5.3.2.

- Develop Aquifer Protection Overlays (APO) (Appendix H-5) – Trihydro has provided recommendations for APOs in Section 5.3.1 and Appendix E-1of this WQMP. This mitigation measure is recommended to move forward immediately, and next steps include working with Teton County Planning staff to incorporate recommendations by drafting proposed LDR amendments and moving them through the formal planning process for adoption.
- Implement Recommendations from Other Plans (Appendix H-6) – Trihydro recommends that structural management practices, non-structural management practices, administration and monitoring, and other recommendations outlined in existing and future plans be incorporated into the WQMP as they are developed. Recommendations included in the Flat Creek Watershed Management Plan are incorporated into the Action Plan discussed in Section 7.0.
    - Implement Fish Creek Watershed Management Plan (Appendix H-8) – Preparation of the Fish Creek Watershed Management Plan is underway, and actions should be integrated into the WQMP Action Plan.
    - Implement Town of Jackson *Stormwater Management Program* (Appendix H-9) – Preparation of this document is underway, and actions should be integrated into the WQMP Action Plan.
- Biosolids Reuse/Disposal (Appendix H-7) – Trihydro recommends this mitigation measure move forward immediately. Teton County Integrated Solid Waste & Recycling (ISWR) is currently accepting biosolids for composting and ISWR should work with the County's composting contractor to evaluate expanding the program.

There are two mitigation measures for which Trihydro recommends that only the first portions of the mitigation measure be implemented immediately so as to determine if the measure should be fully implemented or not. These mitigation measures were designated contingent immediate mitigation measures and include:

- Upgrade Existing Large Water Treatment/Wastewater Treatment Plants (Appendix H-10) – The need to upgrade existing WWTPs needs to be supported by additional studies. However, Trihydro does recommend the Town of Jackson conduct groundwater monitoring at existing wells, if they are intact, immediately to determine if the WWTP lagoons are impacting groundwater quality. If the lagoons are impacting water quality, the Town should evaluate the costs associated with replacing the existing liner system and possible new effluent permit limits as potential updates to the 2021 Technical Review Report recommendations. Drinking water quality countywide does not demonstrate a need to upgrade or connect additional customers to existing large water treatment plants.
- Continue Implementation of In-line Stormwater Treatment or Green Infrastructure in Town (Appendix H-11) – Trihydro recommends this mitigation measure move forward as an immediate need if currently identified in the Town of Jackson's *Surface Water Drainage Infrastructure Master Plan.* Otherwise, recommendations presented in the Town of Jackson's forthcoming *Stormwater Management Program* should be incorporated into the WQMP Action Plan as recommended by the Town of Jackson's consultant.

Eight short-term and four long-term mitigation measure recommendations are summarized in Tables 5-6 and 5-7. The ten mitigation measures not recommended to move forward as part of the WQMP are summarized in Table 5-8 and should be considered when the WQMP is updated in the future.

6.0 GOVERNANCE

Implementation of the WQMP will be the responsibility of and led by Teton County. Teton County has budgeted for, and is in the process of, hiring a Water Resources Program Manager (WRP Manager). The WRP Manager's responsibilities will include:

- Establish, lead, and serve as staff for the Water Quality Advisory Committee.
- Coordinate with the Town of Jackson, TCD, and WDEQ.
- Coordinate and support adoption of SWF and LDR amendments.
- Coordinate implementation of inspection and maintenance program.
- Coordinate implementation of the water quality monitoring program with TCD and the USGS.
- Identify potential funding opportunities or collaboration with other organizations.
- Conduct WQMP performance monitoring and reporting.
- Prepare and issue an annual report summarizing key accomplishments, milestones, metrics, and water quality changes.

Coordination with outside entities, such as the Town of Jackson, TCD, USGS, WDEQ, WGFD, NPS, USFS, USFWS, and NGOs, is critical to ensure successful implementation of the WQMP. In order to remain nimble and begin implementation of the WQMP immediately after adoption, Trihydro recommends creating a Water Quality Advisory Committee (WQAC) consisting of five members:

- One current employee from the Town of Jackson, Teton County and TCD (three total seats). The WRP Manager cannot serve on the WQAC.
- One at-large member who resides in the Town of Jackson.
- One at-large member who resides in Teton County, outside of the Town of Jackson.
- The WQAC could invite individuals representing other government entities or NGOs to serve in an advisory capacity to the WQAC as they feel appropriate.

The purpose of the WQAC is to assist the WRP Manager with project coordination and advise the WRP Manager regarding the overall implementation of the WQMP. Responsibilities of the WQAC may include, but are not limited to:

- Meet annually, prior to the start of the annual budgeting process, to develop an annual work plan to prioritize projects for the next fiscal year and for inclusion in lead agencies' annual budgets.
- Identify opportunities to jointly execute and/or fund projects between each organization responsible for implementing WQAs identified in the WQMP.
- Review and provide input on the annual progress report prepared by the WRP Manager.
- Annually, re-evaluate immediate, contingent immediate, short-term, and long-term WQA's and reprioritize if future assessments, studies, and data collection efforts indicate WQAs need to be reprioritized.

The WQAC should meet annually at a minimum, but meetings can be scheduled as needed at the discretion of the WQP Manager or the chairperson of the WQAC.

As implementation of the WQMP matures, Teton County may determine that the formation of a Regional Water Quality Organization (RWQO), similar to a Regional Transportation Planning Organization, may better serve the citizens of Teton County. The RWQO would undertake water quality planning for the Town and County and provide coordination between local, regional, state, and federal water quality programs, as well as be eligible to accept local, state, Federal, and private grants and enter contracts. Establishment of a RWQO should be evaluated as part of the first five-year technical update, which is discussed in the following section.

6.1 MEASURING SUCCESS

Tracking progress related to implementation of WQAs will be the responsibility of Teton County. Teton County will coordinate with the Town of Jackson, TCD, USGS, WDEQ, WGFD, NPS, USFS, USFWS, and NGOs to obtain annual updates on the progress of WQAs undertaken by each organization. Progress will be evaluated by the WQAC and reported to the BOCC by the WRP Manager based on the following:

- Identify WQAs included in the prior year's work plan that are complete.
- Determine if the implementation of WQAs are functioning as intended and benefiting water quality.
- Analyze water quality data to determine if increasing or decreasing trends are occurring and identify potential causes of changes in water quality.
- Review, revise, and even reprioritize WQAs in the WQMP.

At a minimum, progress made toward implementation of the WQAs should be evaluated annually to determine if individual WQAs need modified or reprioritized.

Progress made during a given year should be summarized and included in an annual Water Quality report. The report should address:

- Discuss progress made toward implementation of WQAs based on metrics provided in Section 7.0.
- Summarize quality conditions of groundwater and surface waters and note improvements and/or degradation. Water quality information obtained as part of the countywide water quality monitoring program and from other projects should be included.
- Identify changes made, or reprioritization of WQAs.

The annual report will be provided to the Teton County BOCC, Town of Jackson Town Council, TCD Board of Directors, NGOs, and the citizens of Teton County by the end of the first quarter following the year for which the report was prepared. For example, the 2024 Annual Report would be due by March 31, 2025.

As WQAs are implemented, additional water quality data are obtained, and local conditions change, it is important to prepare technical updates periodically. Continued population growth, increased visitation, further development, climate change, and evolving environmental regulations will continue to challenge Teton County, the Town of Jackson, TCD, and the citizens of Teton County. At a minimum, technical updates should be prepared every five years to summarize progress made since the previous technical update; update and reprioritize WQAs; and, evaluate changes in water quality. Future technical updates also provide an opportunity to establish numerical water quality criteria to track the effectiveness of WQAs that were previously implemented.

7.0 ACTION PLAN

The following action plan is intended to assist the County in maintaining momentum and achieving the water quality protection goals as identified in the WQMP. The Essential Actions (2024-2025) are of highest priority for the County to initiate and are the foundation for all other implementation actions. Immediate Actions (2024-2026) identify high priority actions that are regulatory or administrative in nature, will immediately strengthen water quality protections, and will provide meaningful measures of water quality. Short-Term Actions (2024-2029) identify mitigation actions that are to be implemented over a five-year period and Long-Tern Actions (2024-2044) are over a twenty-year period.

7.1 ESSENTIAL ACTIONS (2024 – 2025)

The following actions are essential to moving the WQMP forward, and it is critical that they are completed within the first year to ensure successful implementation of the WQMP. Essential actions include:

- Teton County BOCC adopts the WQMP.
- Create and fill a Water Resources Program Manager position to lead and coordinate efforts with other County staff and WQMP partners, such as the Town, TCD, WDEQ, POWJH, etc.
- Confirm which agency will be responsible for implementing each water quality action. Each agency will identify staffing needs. Staffing needs will vary by agency but will require up to two full-time positions across all lead agencies.
- Fill the vacant Sanitarian position to provide support to the County Engineer in regulating SWFs.
- Select contracting resources where needed for implementation.
- Establish and appoint members to a WQAC.

7.2 IMMEDIATE ACTIONS (2024 – 2026)

WQAs identified as an immediate need (high priority), or WQAs that are recommended for implementation within the first two years are summarized in Table 7-1. The table groups WQAs by WQA category and includes the following information:

- Name - the name of the WQA.
- Agency Involvement – identifies the lead and supporting agencies.
- Estimated Cost – provides an estimated low and high cost. Estimated costs are preliminary and guide the planning process but are not intended to serve as budgetary estimates.

- Staffing Needs – provides an estimate of full-time equivalents (FTE) needed to execute the WQA. Staffing needs will vary depending on the lead agency's specific needs.
- Metric – identifies proposed metrics for measuring success.
- Reference – refers to other tables or appendices where additional information can be found.

Immediate actions are estimated to cost approximately $10MM to $16.6MM during the first two years of the WQMP and will potentially require hiring up to 2 FTE in addition to the WRP Manager and the 2 FTEs recommended as actions. Staffing requirements will be dependent upon the lead agency. The lead agency could elect to utilize consultant services in lieu of hiring new staff during the first two years.

7.3 SHORT-TERM ACTIONS (2024 – 2029)

WQAs identified as a short-term need (moderate priority), or WQAs recommended for implementation within the first five years, are summarized in Table 7-2. The table groups WQAs by WQA category following by information such as:

- Name – the name of the WQA
- Agency Involvement – identifies the lead and supporting agencies.
- Estimated Cost – provides an estimated low and high cost. Estimated costs are preliminary and guide the planning process but are not intended to serve as budgetary estimates.
- Staffing Needs – provides an estimate of full-time equivalents (FTE) needed to execute the WQA.
- Metric – identifies proposed metrics for measuring success.
- Reference – refers to other tables or appendices additional information can be found.

Short-term WQAs can be implemented at any time over the five-year period under the advisement of the WQAC. Short-term actions are estimated to cost approximately $5.2MM to $10.1MM during the first two years of the WQMP. Three FTEs may be needed across all lead agencies or lead agencies may elect to utilize consultant services during the first five years. Each lead agency should evaluate hiring needs annually to determine if a new hire is necessary as existing staff may have capacity to absorb additional workload.

7.4 LONG-TERM ACTIONS (2024 – 2044)

WQAs identified as a long-term need (low priority), or WQAs that are recommended for implementation over the 20-year planning period, are summarized in Table 7-3. The table groups WQAs by WQA category following by information such as:

- Name – the name of the WQA
- Agency Involvement – identifies the lead and supporting agencies.
- Estimated Cost – provides an estimated low and high cost. Estimated costs are preliminary and guide the planning process but are not intended to serve as budgetary estimates.
- Staffing Needs – provides an estimate of full-time equivalents (FTE) needed to execute the WQA.
- Metric – identifies proposed metrics for measuring success.
- Reference – refers to other tables or appendices where additional information can be found.

Long-term WQAs can be implemented at any time over the 20-year period under advisement of the WQAC. Long-term actions are estimated to cost approximately $17M to $33MM dollars during the next 20 years of the WQMP. Two to three FTEs may be needed across all lead agencies or lead agencies may elect to utilize consultant services during the first twenty years. Each lead agency should evaluate hiring needs annually to determine if a new hire is necessary as existing staff may have capacity to absorb additional workload.

7.5 OTHER ACTIONS

Other WQAs suggested throughout the process were evaluated but were not recommended for implementation as part of the WQMP at this time. Actions associated with additional studies, education, governance and policy, and mitigation measures not recommended at this time are summarized in Table 7-4.

7.6 FUNDING

Teton County, Town of Jackson, and Teton Conservation District are not currently funded at a level to implement the immediate actions identified in Section 8.2. However, Teton County residents approved $10MM of Specific Purpose Excise Tax (SPET) funds to support water quality projects in Teton County during the November 8, 2022 general election. SPET funds for water quality projects are not anticipated to start being distributed until November 2024. The anticipated distribution in November 2024 is $390,447 (Teton County 2023).

In addition to the SPET funds, projects may be funded under each entity's General Fund as budgeted for each fiscal year.

Projects have been, and will continue to be, funded in part by Section 319 grants through WDEQ. Section 319 grants are designated for projects that will improve impaired water bodies. WDEQ provides a little less than $1MM to conservation districts, nonprofit organizations, watershed groups, school systems, and government agencies across Wyoming to design and implement projects that will reduce and prevent nonpoint source pollution. For individual project applications, WDEQ recommends funding requests range from $10,000 to $300,000. A 40% cost share from non-federal sources is required and may include cash and/or in-kind contributions (WDEQ 2023a). Section 205j grants are available to towns, counties, and conservation districts in Wyoming for water quality management planning and assessment projects focused on impaired waterbodies. Estimated funding for the 2024 fiscal year is $80,000.

The State of Wyoming CWSRF and Drinking Water State Revolving Fund (DWSRF) provide loan financing to public entities for water or wastewater infrastructure improvement projects. Almost any project with a water quality benefit can potentially be funded by the CWSRF. Typical projects include sewer line replacement, lagoon rehabilitation, wastewater treatment plant upgrades, landfill closures or expansions, wetland development or restoration, water reuse projects, planning studies focused on water management and quality, lagoon dredging, stormwater management, water conservation, water reuse, security measures for publicly owned treatment works, and decentralized wastewater treatment systems. The DWSRF is used for new or upgrades to treatment plants, transmission lines, finished water storage tanks, and the creation of new systems or regionalization of existing systems. Loans are typically paid back over a twenty year period and the standard interest rate is typically 1.5%. Some level of principal forgiveness amounts vary and can range from 25%-75% of the total loan amount. Projects in Teton County typically have 25% or less of principal forgiven. Additional federal funding for both State Revolving Fund (SRF) projects was allocated with the Investment, Infrastructure, and Jobs Act (IIJA) and Bipartisan Infrastructure Law (BIL). The additional funding provides more funding for CWSRF and DWSRF projects, as well as new funding for emerging contaminant and lead service liner projects. The first step for projects to be eligible for grants is to be included on the 2024 CWRLF and DWRLF IUP. Project sponsors should submit possible projects for inclusion on the appropriate IUP on or around February 15th of each year (WDEQ 2023b).

Private funding has been leveraged to execute numerous stream restoration, riparian improvement, and wetlands projects. Exploring opportunities to partner with organizations, such as Trout Unlimited, Ducks Unlimited, Snake River Fund, and other NGOs, is recommended.

Local entities, such as Teton County, the Town of Jackson, and TCD, have a good understanding of potential funding sources and how a specific funding source may be applied to a project. They also understand the timelines, challenges, and benefits associated with specific funding sources and should collaborate when practical to obtain funding and implement projects.

8.0 REFERENCES

Ablondi, R. 1978. Teton County Water Quality Management Program. Prepared for The Teton County 208 Planning Agency by the Teton County Planning Office. 56, 60 p.

Girard, C.E., Gosselin, E.N., Remlinger, B.E., and Stallings, B.M. 2019. Flat Creek Watershed Management Plan, Teton County, WY 2019 Revision. Jackson: Teton Conservation District. 7 p.

Lee, D. 2023. 'RE: Teton County – Water Quality Monitoring.' WQMP discussion, August 28 [Online]. Available e-mail: david@tetonconservation.org

Miller, C. 2023. 'Teton County – Water Quality Monitoring.' WQMP discussion, August 15 [Online]. Available e-mail: cemiller@usgs.gov

PAWS. 2023. PAWS Mutt Mitts. Available from: https://pawsofjh.org/our-work/#paws-mutt-mitts

Teton Conservation District. 2023. TCD Well Test Kits. Available from: https://www.tetonconservation.org/well-test-kits

Teton County. 2021. Teton County Land Development Regulations. Teton County: Teton County Public Works Department.

Teton County. 2023. Board of County Commissioners – Meeting Report [Online]. Obtained from: https://tetoncountywy.gov/DocumentCenter/View/25456/05021-2022-SPET-distribution-1st-year-only

Teton County Engineering Division. 2022. Title 9, Small Wastewater Facility Regulations. Teton County: Teton County Engineering Division.

Town of Jackson. 2001. Surface Water Drainage Infrastructure Master Plan. Town of Jackson

Town of Jackson and Teton County. 2020. Jackson/Teton County Comprehensive Plan. Teton County: Town of Jackson and Teton County. 1-3 – 1-4 p.

Trihydro Corporation. 2023. Stormwater Pollution Guide. Electronic: Teton County Water Quality Master Plan.

United States Census Bureau (USCB). 2022a. QuickFacts, Teton County, Wyoming [Online]. Available from: https://www.census.gov/quickfacts/tetoncountywyoming.

Wyoming Department of Environmental Quality (WDEQ). 2020. Wyoming's 2020 Integrated 305(b) and 303(d) Report. Available from: https://deq.wyoming.gov/water-quality/watershed-protection/water-qualityassessment/.

Wyoming Department of Environmental Quality (WDEQ). 2023a. Grant Resources [Online]. Obtained from: https://deq.wyoming.gov/water-quality/watershed-protection/nonpoint-source/

Wyoming Department of Environmental Quality (WDEQ). 2023b. State Revolving Fund Program. What is It? [Online]. Obtained from: https://drive.google.com/file/d/1TEG0Z1Fx_CW52zFeMVslpDpdaF_-BFyH/view

TABLES

TABLE 5-1. ADDITIONAL STUDIES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR ADDITIONAL STUDIES	DESCRIPTION	OBJECTIVE	VOTES[1]	NEED TIME FRAME	CAPACITY IMPACT	IMPLEMENTATION TIME FRAME[2]	COST	AGENCY INVOLVEMENT		RECOMMENDATION
									LEAD	SUPPORT	
1	Small Wastewater Facility (SWF) Inventory/Audit	Inventory SWF age, type, groundwater level, soil absorption system depths countywide to create a comprehensive database of existing septic systems and determine if SWF soil absorption systems have adequate groundwater separation.	Over 2,600 SWF systems have been accounted for, but there is estimated to be 800 to 1000 systems unaccounted for. The database is lacking important information related to date installed, type, groundwater level (at the time of permitting), and soil absorption system type. There are instances where systems pre-date regulation and conventional soil absorption systems were installed in shallow groundwater. An inventory will further inform decision makers in prioritizing which systems need upgraded or connected to a central treatment plant.	**6**	Immediate	Low	Moderate	$	Teton County	NA	Recommend moving forward with the inventory and audit immediately. A robust SWF inventory will support further decision making during future wastewater planning efforts. The inventory could be initiated and completed in a short time frame, relative to other WQA's.
2	Alluvial Aquifer Characterization	Prepare a countywide characterization of the alluvial aquifer to further define the complex alluvial aquifer and aquifer characteristics at different depths.	These five studies are combined because there is surface and groundwater interaction throughout the extend of the alluvial aquifer. Conducting hydrogeologic and hydrologic studies and the same time will minimize spatial and temporal variability seen when trying evaluate individual studies conducted at different times. Many previous studies recommended completing a detailed characterization of the alluvial aquifer. Most of the previous studies have focused on the West Bank area, but minimal information is available for the remaining areas of the county. The characterization's objectives would include: A. Accurately map seasonal groundwater levels; B. Estimate aquifer production at quality at various depths; C. Determine the aquifer's assimilative capacity; D. Determine background water quality - including seasonal groundwater quality E. Conduct detailed nutrient loading estimates to further characterize effects atmospheric deposition, manmade ponds, natural sources, and anthropogenic sources have on seasonal groundwater quality to support development of future TMDLs. F. Determine sources of contaminants utilizing appropriate source tracking utilizing microbial source tracking and/or tracers G. Determine the influence manmade ponds and irrigation return have on surface and groundwater quality	**1**	Immediate	High	Long	$$$$$	Teton County	TCD USGS WDEQ	Trihydro recommends moving forward with this study immediately as it will take several years for iniation, data collection, and analysis. The study will fill data gaps identiefied in various volumes of the Water Resources Assessment and provide information needed to support future mitigation measure implementation or necessary regulatory changes. Staffing impacts will be high for both the lead entity and supporting entities. The study would require 0.5 FTE's to oversee and coordinate supporting agencies. Supporting agencies will likely need to commit time for up to 0.25 FTEs. Next steps would include preparing an RFP, selecting and contracting with a consultant, conducting the study, then implementing recommendations which are set forth in the study.
	Hydrologic Study	Conduct a detailed hydrologic and mass balance study of the Snake River and its tributaries, including mass balance calculations, to collect data on streamflow's and water quality to determine if water quality is improving or degrading.		**1**							
	Source Tracking Studies for Constituents of Interest (COI)	Conduct additional source tracking studies focused on COI's such as *E. coli* and nutrients to determine the sources of COIs and further inform future water quality actions.		**5**							
	Investigate Effects of Manmade Ponds on Surface and Groundwater Quality	The investigation would evaluate the effect manmade ponds may, or may not, have on groundwater quality.		**4**							
	Characterize Effects of Irrigation Return Flows	The study would characterize irrigation return flows to determine how irrigation return flows impact surface water quality.		**1**							
3	Infrastructure Inventory & Operational Database	Prepare an inventory of privately and publicly owned drinking water and wastewater infrastructure in Teton County to provide a single reference for systems regulated by multiple regulatory agencies such as the EPA, WDEQ, and Teton County.	These two inventories are combined into a single study. Publicly available information on public water supplies and wastewater treatment systems were compiled and summarized on *Volume II* and *Volume V* of the *Water Resources Assessment*. The objective of this inventory is to create and maintain a databese of existing systems and water quality data reported to regulatory agencies. Ideally, water quality data would be voluntarily shared with Teton County, but it could also be obtained from state and federal agencies via a public records request.	**4**	Short-Term	Low	Moderate	$	Teton County	TCD	Trihydro recommends moving this inventory forward as a short-term action. Coordination with regulated entities and regulators will likely take a year or more. The existing GIS mapping of water and wastewater systems should be updated annually. A water quality database should be created to maintain water quality data reported by each system and integrated into the water quality monitoring program database. This will require about 0.25 FTE's to implement and maintain on an annual basis.
	Inventory Public and Private Water Supplies	Accurately inventory public and private water supplies throughout the County which will provide detailed location, system type, and water quality data which will be useful for future planning efforts.		**5**	Short-Term		Short	$			

TABLE 5-1. ADDITIONAL STUDIES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR ADDITIONAL STUDIES	DESCRIPTION	OBJECTIVE	VOTES[1]	NEED TIME FRAME	CAPACITY IMPACT	IMPLEMENTATION TIME FRAME[2]	COST	AGENCY INVOLVEMENT		RECOMMENDATION
									LEAD	SUPPORT	
4	Verify Membrane Wastewater Treatment Systems Provide Temperature Regulation	Wastewater treatment systems which use membrane technologies are most effective when they operate within a specific temperature range.	This study would evaluate the seasonal operating temperature ranges for membrane systems in the County and optimum temperatures are maintained during the winter months.	**1**	Long Term	Low	Short	$	Teton County	NA	Trihydro does not recommend conducting this study. Wastewater treatement systems utilizing this technology are required to monitor and report effluent quality as part of their WYPDES discharge permit requirements. It is known that membrane wastewater treatement technologies are not as effective during the winter months. Wastewater treatment facilities utilizing this technology should evaluate system operations, identify operational changes, and implement operational changes needed to improve treatment during winter months.
5	Inventory Stormwater Systems & Identify Areas in Need of Stormwater Management	Teton County does not have a current inventory of stormwater control and treatment systems within the County.	The study will identify stormwater control systems and treatment systems throughout the county to determine which areas in the County will benefit from improved stormwater control/treatment systems.	**8**	Immediate	Low	Short	$	Teton County	Town of Jackson WYDOT	Trihydro recommends moving forward with this inventroy immediately. The development of a stormwater control and treatment system inventory will identify areas of the County with stormwater control and treatment and identify areas which need stormwater control. Combined with recommended water quality monitoring, the study will help identify future areas in need of stormwater treatment.
6	Identify Wastewater Treatment Options for Developed Areas in County	Developed areas of Teton County are served either by the Town of Jackson, Aspen Pines, or Teton Village treatment plants; small wastewater facilities; or Class V injection facilities.	This study would evaluate if existing SWFs can be easily connected to existing collection systems and WWTPs; if additional satellite plants can be constructed; or, if SWFs are appropriate.	**8**	Immediate	Low	Moderate	$$	Teton County	Town of Jackson Aspens-Pines Teton Village	Trihydro provided recommendations in Appendix E-2 of the WQMP. Trihydro recommends moving forward with recommendations provided in Appendix E-2 and prepare biannual updates to the *Wastewater Treatment Priority Areas* map and evaluation.
7	Evaluate Stormwater Treatment Feasibility	Stormwater may require treatment to prevent degradation of surface and groundwater from stormwater discharges.	This study will evaluate feasibility of implementing multiple stormwater treatment technologies such as reverse osmosis, filtration, or green infrastructure.	**6**	Short-Term	Low	Short	$	Teton County Town of Jackson	TCD	Trihydro recommends evaluating stormwater treatment feasibility upon completion of the stormwater infrastructure inventory and water quality monitoring as a short-term measure.
8	Evaluate Wetland Banking Challenges	Wetland banking is a system which ensures that ecological loss is compensated by the preservation and restoration of wetlands, natural habitat, and streams in other areas so that there is no net loss to the environment. The purpose of the bank is to provide compensation for unavoidable loss of wetlands permitted under Section 404 of the Clean Water Act. Banks can be created by a government agency, nonprofit organization, corporation, or other agency undertakes restoration, establishment, enhancement, or preservation of aquatic resources undera formal agreement with a regulatory agency.	The evaluation would identify benefits and challenges related to establishing a wetland mitigation bank in Teton County. No wetland mitigation banks are currently created in Wyoming and will require coordination with State and Federal agencies.	**3**	Long Term	Low	Short	$	Teton County	USEPA USACOE USFWS WDEQ NGOs	Trihydro recommends this evaluation as a long-term need. Extensive wetlands and riparian areas are found in Teton County, which are protected via land development regulations and federal agencies. Wetland banking does provide a mechanism to ensure wetland area is maintained, or increased, if wetlands cannot be avoided when constructing critical transportation, drinking water, stormwater, and wastewater infrastructure. This evaluation could be expeditied if an NGO was willing to commision a study earlier. If not, it could be managed by County staff, but would require some time to manage the contract with the selected consultant.

TABLE 5-1. ADDITIONAL STUDIES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR ADDITIONAL STUDIES	DESCRIPTION	OBJECTIVE	VOTES[1]	NEED TIME FRAME	CAPACITY IMPACT	IMPLEMENTATION TIME FRAME[2]	COST	AGENCY INVOLVEMENT		RECOMMENDATION
									LEAD	SUPPORT	
9	Review Status of Transportation Safety, Emergency Response, and Chemical Application Programs	Review local emergency response plans and pesticide application programs.	The review would determine if local emergency response plans and pesticide application programs adequately address protection of surface and groundwater water quality.	**0**	Immediate	Moderate	Short	$	Teton County	Teton County Weed & Pest Teton County Emergency Management WYDOT	Trihydro recommends coordinating with state and transportation agencies, emergency management agencies, and pesticide applicators immdediately. The coordination effort should determine if spill response plans adequately protect water quality and coordinate responsibilities for various spill response scenarios. This coordination effort will also inform emergency response plans prepared in conjunction with future Source Water Protection Plans. This measure will require about a quarter of existing staff's time for a year. Next steps include contacting the supporting agencies and faciliting a discussion regarding existing response plans. Then, if warranted, updating each entitie's emergency response plan to reflect changes identified during previous meetings.

TABLE 5-1. ADDITIONAL STUDIES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR ADDITIONAL STUDIES	DESCRIPTION	OBJECTIVE	VOTES[1]	NEED TIME FRAME	CAPACITY IMPACT	IMPLEMENTATION TIME FRAME[2]	COST	AGENCY INVOLVEMENT		RECOMMENDATION
									LEAD	SUPPORT	
10	Study Urban Impacts to Air and Snow	The study would quantify how urban areas impact air quality and water quality via snow melt.	These four suggested studies should be combined into a single study. Trihdro identfied snow storage areas in the county, but the overall impact to water quality is not well defined. The purpose of the study would: A. Identify commercial snow storage areas B. Quantify pollutants in stored snow C. Evaluate the impacts to water quality and provide recommendations to mitigate impacts for commerical and residential snow removal D. Evaluate additional snow storage regulations for incorporation into Land Development Regulations. D. Evaluate alternative snow management practices, such as snowmelt systems E. Determine the net environmental impacts of various snow management methods.	**0**	Short-Term	Moderate	Short	$	Teton County	TCD	Trihydro recommends moving the snow storage study forward immediately. Trihydro identified snow storage areas in the Water Resources Assessment, but it was not a comprehensive evaluation. The study will identify snow storage areas and their impacts to water quality. Findings of the initial phases of the study will support the development of recommendations for future LDR amendments; evaluaqte the feasibility of other snow management practices. Staffing impacts should be low as the study would liekly be conducted by a consultant. About 0.25 FTEs would be needed to manage the plan on Teton County's behalf. Next steps would include hiring a consultant to perform the feasibility study, performing the feasibility study, then implementing recommendations provided in the study.
	Inventory Snow Storage Areas	Inventory private and public snow storage areas to develop a further understanding of where snow is stored and aid in determining potential impacts to surface and groundwater quality.		**3**	Immediate		Short	$			
	Quantify Pollutants in Snow Storage Piles	Snow storage piles have the potential to store high concentrations of solids and deicing chemicals. The study would evaluate the impact snow storage areas could have on water quality.		**2**	Immediate		Short	$			
	Evaluate Air Quality Impacts of Current Snow Removal Practices vs Snowmelt Systems	Current snow removal and storage practices require hauling snow to central storage areas. The study would compare the environmental impacts caused by current practices and the use of snow melt systems.		**2**	Short-Term		Short	$			
11	Evaluate Feasibility of Greywater and Treated Effluent Reuse	Greywater is domestic wastewater without fecal contamination. Sources include sinks, showers, baths, washing machines, and dishwashers. Greywater can be reused to irrigate lawns and gardens which reduces demand on drinking water supplies. Treated wastewater, or effluent, could be used to irrigate parks and agricultural fields, thus reducing demand on surface and groundwater resources.	The feasibility study would evaluate the potential for reusing greywater, or treated effluent, for irrigation by homeowners, landowners, and public entities. The study would also evaluate the installation of parallel pipelines to transport treated effluent to large, irrigated areas. Possible impacts to groundwater and surface water along with additional treatment requirements would need to be evaluated.	**4**	Short-Term	Low	Moderate	$$	Teton County	Town of Jackson	Trihydro recommends moving this study forward as a short-term study. The Town of Jackson produced 188 million gallons (MG) of treated drinking water and inflows to the WWTP from the Town of Jackson were 55.7 MG which indicates over 130 MG were used for uses outside of residential and commercial uses. Implementation of greywater or treated effluent reuse could reduce drinking water supply demands from all public water supplies. This study would not be conducted by Coutny or Town Staff, but would likley require 0.25 FTEs from each entity to oversee and coordinate the study conducted by a consultant. Next steps would include hiring a consultant to perform the feasibility study, performing the feasibility study, then implementing recommendations provided in the study.

TABLE 5-2. EDUCATION INITIATIVES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR EDUCATION INITIATIVES	DESCRIPTION	VOTES	IMPLEMENTATION TIME FRAME	RECOMMENDATION
1	Source Water Protection	Inform public water supplies (PWS), and their users, of the benefits of conducting source water assessments (SWA) and source water protection plans (SWPP).	3	Immediate	This initiative should be implemented immediately to stress the importance of source water assessments and protection planning to build support of preparation of SWPPs.
2	Voluntary Public Water Supply and Private Well Testing	Inform the public of the benefits of water supply well testing of public and private wells. It would explain how frequent testing can protect users and further aid the evaluation of groundwater quality.	3	Short-Term	Voluntary testing of public water supplies at frequencies greater than required by the Safe Drinking Water Act will inform operators and customers of PWS of their drinking water quality periodically (i.e. quarterly) throughout the year. Benefits of voluntary private well testing need to be communicated and the TCD Private Well Test Kit program promoted.
3	Benefits of Water Quality Protection Overlay	Explain the benefits of establishing a aquifer protection overlay district and how they would protect private water supplies.	3	Immediate	If Land Development Regulation (LDR) amendments are moved forward, this education campaign should move forward immediately as well to explain the need and foster support from Teton County residents.
4	Water Resource Protection for Developers	Land development can impact both surface and groundwater quality if the appropriate best management practices are not implemented. The education campaign, focused on developers would describe best management practices to consider during planning, design, and construction of development projects.	7	Immediate	This campaign should be forward immediately to further inform developers of impacts development has on water quality and present best management practices which can be implemented to protect water quality throughout the development's life-cycle.
5	Well Owner Education on Source Water/Wellhead Protection	A education program directed and both private and public water supplies which explains what source water and well head protection are; and, present various source water and wellhead protection best management practices (BMP).	4	Immediate	This education campaign should begin immediately to inform public water supplies of the benefits of source water protection planning in hopes to generate interest to volunteer for the upcoming Wyoming Department of Environmental Quality (WDEQ) led source water protection project.
6	Pet Waste Cleanup Program	Expand on current pet waste cleanup education initiatives to continue to educate the public about the impacts pet waste can have on water quality.	2	Existing	This is an ongoing effort by Providing Animal Welfare Services (PAWS) and should not be taken on by Teton County. However it should continue to be supported by Teton County.
7	Trout Friendly Lawns	Expand on current Trout Friendly Lawn education initiatives to continue to educate the public on lawn care practices which minimize impacts to water quality.	7	Existing	This is an ongoing effort by the Jackson Hole Clean Water Coalition (CWC) and should not be taken on by Teton County. However, Teton County should support the CWCs efforts moving forward.

TABLE 5-2. EDUCATION INITIATIVES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR EDUCATION INITIATIVES	DESCRIPTION	VOTES	IMPLEMENTATION TIME FRAME	RECOMMENDATION
8	Small Wastewater Facility (SWF) Operation & Maintenance	SWFs can impact water quality if not routinely inspected and properly maintained. The public education campaign will provide information to SWF owners which explains how SWF can potentially impact groundwater quality and how to properly perform routine SWF operations and maintenance (O&M) activities.	10	Immediate	This campaign should move forward immediately prior to, and during the promulgation of SWF regulation amendments. Also, SWF O&M education should be provided to new homeowner's to educate them on the importance of SWF O&M.
9	Applications of Pesticides and Fertilizers	Conduct an education campaign which presents BMPs and applicable regulatory requirements for the application of pesticides and fertilizers. The campaign would also explain how pesticide and fertilizer application can impact water quality.	3	Immediate	If LDR amendments are moved forward, this education campaign should move forward immediately as well to explain the need and foster support from Teton County residents. This campaign can also be incorporated into current and future Trout Friendly Lawn's outreach initiatives.
10	Water Reuse/Conservation	Education campaign to explain the benefits of conserving water by reducing use and possibly reusing water. The campaign will present BMPs related to reuse and conservation.	1	Long-Term	This campaign should be conducted in coordination with future water reuse/conservation projects.
11	Emerging Contaminant Education (PFAS, pesticides, *E. coli*)	This campaign will continually inform the public of regulatory developments, the sources of, and potential impacts emerging contaminants could have on water resources.	2	Immediate	The campaign focused on PFAS should be initiated immediately due to pending drinking water standards for PFAS. Separate campaigns could be created for pesticides/herbicides and *E. coli*, and would not necessarily need to be conducted immediately.
12	Native Landscaping	This campaign would explain the benefits of native landscaping and specifically, how it benefits both water quality and reduces water use.	6	Short-Term	Providing an education campaign to explain the benefits of native landscaping related to water use and environmental benefits is not an immediate need, but is recommended to move forward as a short-term need. The campaign may aid in generating public support for future water reuse initiatives.
13	Benefits of Stream Buffers	Create a campaign to emphasize the importance of stream buffers and how they can protect water quality when located appropriately from surface waters.	3	Short-Term	Stringent stream buffer requirements are provided in the County and Town LDRs. Trihydro recommends moving this forward as a short-term education campaign to raise public awareness which ultimately will result in residents implementing more stringent buffers voluntarily.

TABLE 5-2. EDUCATION INITIATIVES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR EDUCATION INITIATIVES	DESCRIPTION	VOTES	IMPLEMENTATION TIME FRAME	RECOMMENDATION
14	Snow Storage Best Practices	The campaign will target commercial snow removal companies and individuals. The campaign will provide snow removal BMPs and how they benefit water quality.	2	Short-Term	This campaign should be conducted upon completion of the snow storage study to inform residents of snow storage best practices and the benefits of implementing such measures. Additional education could be provided if the County and Town moved forward with future land development regulations specific to snow storage.
15	Recreational Water Use	Campaign will describe best practices to utilize when recreating in or using surface waters while recreating - i.e. drinking from streams and springs.	0	Not Recommended	Due to no stakeholder support, it is recommended to not move this campaign forward.
16	Water Conservation Best Practices	Prepare a informational flyer which presents BMPs to conserve water and the benefits of doing so.	3	Long-Term	This campaign should be conducted in coordination with future water reuse/conservation projects.
17	Treatment Wetlands	Explain how treatment wetlands can improve water quality while providing critical habitat.	4	Short-Term	If future studies identify the need for additional treatment wetlands, this campaign should move forward to explain the benefits of treatment wetlands.
18	Beneficial Reuse of Manure	Prepare a information flyer targeting stables and ag operations to explain the benefits of reusing manure and how reuse benefits water quality.	0	Not Recommended	Due to no stakeholder support, it is recommended to not move this campaign forward.
19	Agricultural BMPs	Prepare an informational series targeting agricultural operations which describes various BMPs which can be implemented to preserve water quality such as stream setbacks, fencing riparian areas, directing livestock drinking water sources away from streams, etc.	3	Short-Term	Conducting a education campaign on this topic is recommended as a short-term campaign. Agricultural produces are typically aware of practices required to protect water quality, but a refresher would be beneficial in the short-term.

TABLE 5-3. GOVERNANCE/POLICY
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR GOVERNANCE/POLICY	DESCRIPTION	VOTES	IMPLEMENTATION TIME FRAME	RECOMMENDATION
1	Create Regional Wastewater Authority	Establish a regional wastewater authority to manage wastewater countywide. The concept involves consolidating private and public wastewater treatment facilities and small wastewater facilities under a single entity. The Authority would be responsible for ongoing operations and maintenance of wastewater infrastructure.	14	Long-Term	Trihydro does not recommend moving this action forward. Creation of a regional wastewater authority would require approval by the Town of Jackson and all special districts managing wastewater for their residents. Obtaining buy-in from the Town of Jackson and surrounding special districts will be challenging unless a need is identified. While it was not recommended to create a Regional Wastewater Authority, Trihydro does recommend the Town and County cooperatively formalize how future wastewater connections will be managed since the Town owns wastewater infrastructure and the County is responsible for implementing the Water Quality Master Plan (WQMP) - which includes recommendations for additional County sewer connections.
2	Create Local Groups/Teams to Implement WQMP	Create a group to coordinate implementation of the WQMP consisting of governmental and non-governmental organizations.	3	Immediate	Teton County should form a Water Quality Advisory Committee immediately to begin implementing the WQMP. The Committee is discussed further in Section 7 of this WQMP.
3	Septic System Replacement/Connection Program	Identify and prioritize locations which would benefit by connecting to a sanitary sewer line and wastewater treatment plant (WWTP). Also, develop a mechanism to provide funding assistance for the replacement of small wastewater facilities (SWF) to eligible homeowners.	17	Immediate	Trihydro recommends implementing a septic system replacement or connection program immediately. Trihydro has provided recommendations for priority areas for connection to wastewater systems. Trihydro also provided recommendations for areas which will require use of SWFs with enhanced or advanced treatment. In order to facilitate connections, Teton County should estabilsh a fund to provide fincancial assistance to resdients who cannot affort connection to the a wastewater system or replace a SWF with a new system.
4	Create Septic System Overlay	Create a planning overlay which shows areas where SWFs are suitable or require a certain level of treatment.	7	Immediate	Trihydro recommends moving creation of a septic system overlay forward immediately. Trihydro has provided recommendations for areas which should require enhanced or advanced treatment via SWFs as required by proposed groundwater and surface water protection overlays. These ovelays should be updated periodically as future recommended studies are completed.
5	Create Stormwater Utility	Create a stormwater utility to own, operate, and maintain stormwater systems in the County which will ensure stormwater is being managed properly and not impacting water quality.	7	Long-Term	Trihydro recommends moving creation of a stormwater utility forward as a long-term action. The Town of Jackson is currenlty evaluating creation of a stormwater utility as part of their *Stormwater Management Program*. The plan is not yet complete and will be forthcoming in 2024. Regarding Teton County, a stormwater utility should only be evaluated after the County conducts a countyside stormwater infrastructure evaluation.

TABLE 5-3. GOVERNANCE/POLICY
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	SUGGESTIONS FOR GOVERNANCE/POLICY	DESCRIPTION	VOTES	IMPLEMENTATION TIME FRAME	RECOMMENDATION
6	Responsible Management Entity (RME) for SWFs	Create a RME to inspect and maintain SWFs countywide. The RME would be responsible for inspecting, maintaining, and possibly replacing SWFs. The USEPA has identified five management models, which are typically implemented in a phased approach when warranted. Models include: 1. Model 1 - Homeowner Awareness - Informs homeowners of their responsibility for inspection and maintenance. 2. Model 2 - Maintenance Contracts - Requires SWFs to perform routine maintenance and submit maintenance activities to the regulatory authority. 3. Model 3 - Operating Permits - Requires SWFs operate under an operating permit which requires reporting of routine maintenance. 4. Model 4 - RME Operation and Maintenance - For a service fee, O&M transfers to a RME that holds the operating permit. 5. Model 5 - RME Ownership - Ownership of the facility transfers to the RME from the propery owner.	5	Long-Term	Trihydro recommends moving this action forward as a long-term measure. Trihydro has provided recommendations for SWF operating permits, which is the next step in the RME phasing process. Trihydro suggests this action be considered as a long-term measure if other recommendations do not have a positive effect on water quality.
7	Establish Water Conservation Goals	Establish water conservation goals to promote the efficient use of water resources countywide.	3	Long-Term	Trihydro recommends moving this action forward as a long-term measure. Prior to establishing water conservation goals, a better understanding of water use throughout Teton County needs to be developed. Other studies recommended as part of this plan will provide information to support establishment of water quality goals.
8	Require public water supplies (PWSs) to Submit Consumer Confidence Reports (CCRs) to Teton County	Require PWSs to submit CCR's to Teton County which would serve as a central repository of CCRs which could easily be accessed by the public. The database would also provide information for Teton County to determine if drinking water supplies meet drinking water standards.	3	Short-Term	Community PWSs are required to submit CCRs to the EPA, the PWS regulatory agency, and provide them to their custormers on an annual basis. Requiring PWSs to submit CCRs and water quality data to the County is not within the County's regulatory authority. Another alternative would be for the County to obtain CCRs from the EPA Safe Drinking Water Information System annually and submit a public records request to obtain PWS drinking water quality data. The data should then be incorporated into the water quality database.

TABLE 5-4. IMMEDIATE MITIGATION MEASURES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

APPENDIX	MITIGATION MEASURE	DESCRIPTION	RATING	NEED TIME FRAME	VOTES	IMPLEMENTATION TIME FRAME	RELATIVE COST	STAFF NEEDS	AGENCY INVOLVEMENT	
H-2	Source Water Protection Planning (SWPP)	Not all public water supplies (PWS) have completed Source Water Assessments (SWA) or created SWPPs in Teton County. Conduct SWAs and prepare SWPPs for entities which have not conducted SWAs or prepared a SWPP. SWPPs provide additional protection for PWSs who have prepared them.	24	Immediate	3	Moderate	$$	0.5	Teton County	WDEQ, PWSs, WARWS
H-3	Construct RV Dump Station	Construct an RV Dump Station, conveniently located, to reduce illicit discharges countywide.	23	Immediate	5	Short	$$$	0.25	Teton County	Town of Jackson
H-4	County Ownership of Sewer Extensions	The County would obtain ownership of sewer extensions to serve certain areas of Teton County included in the Priority Sewer Connection overlay.	21	Immediate	3	Moderate	$$$$$	1	Teton County	Town of Jackson
H-5	Develop Aquifer Protection Overlays (APOs) to Augment SWPPs	APOs provide protection for private well owners. Areas with an APO would require additional development standards to protect surface and groundwater from impacts due to stormwater and wastewater. Recommendations are provided in the WQMP.	22	Immediate	3	Short	$$	0	Teton County	NA
H-6	Implement Recommendations from Other Plans	Implement Recommendations from Flat Creek Watershed Management Plan (WMP), Fish Creek WMP (forthcoming), Town of Jackson Stormwater Management Program (forthcoming) and Snake River Headwaters Comprehensive River Management Plan	23	Short-Term	0	Long	$$$$$$$$	1	Teton County	Town of Jackson, Teton Conservation District
H-7	Biosolids Reuse/Disposal	Create programs to encourage the reuse of biosolids in Teton County to prevent shipping biosolids out of state.	22	Short-Term	0	Short	$$	0	Teton County ISWR	Terra Firma Organics
H-8	Implement Fish Creek WMP	The Fish Creek WMP is currently under development. Implement recommendations outlined in the forthcoming plan.	25	Immediate	0	Moderate	$$	1	Teton Conservation District	Teton County, Town of Jackson, WDEQ
H-9	Implement Town of Jackson Stormwater Management Program	The TOJ Stormwater Management Program is currently under development. Implement recommendations provided under the forthcoming program.	24	Short-Term	6	Moderate	$$$$$$	0	Town of Jackson	Teton Conservation District, Teton County, Snake River Fund

TABLE 5-5. CONTINGENT IMMEDIATE MITIGATION MEASURES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

APPENDIX	MITIGATION MEASURE	DESCRIPTION	RATING	NEED TIME FRAME	VOTES	IMPLEMENTATION TIME FRAME	RELATIVE COST	STAFF NEEDS	AGENCY INVOLVEMENT	
H-10	Upgrade Existing Large Water Treatment/Wastewater Treatment Plants	Upgrade existing WWTPs and large water treatment plants to provide a higher level of treatment and to serve additional customers.	17	Long-Term	9	Long	$$$$$$$$$$	0	Town of Jackson, Aspen Pines, Teton Village	Teton County, TCD
H-11	Continue Implementation of In-line Stormwater Treatment or Green Infrastructure in Town	The Town of Jackson has, and is, currently evaluating their stormwater system and identifying additional areas which require in-line stormwater treatment.	21	Moderate	4	Moderate	$$$$$$	0	Town of Jackson	NA

TABLE 5-6. SHORT-TERM MITIGATION MEASURES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

APPENDIX	MITIGATION MEASURE	DESCRIPTION	RATING	NEED TIME FRAME	VOTES	IMPLEMENTATION TIME FRAME	RELATIVE COST	STAFF NEEDS	AGENCY INVOLVEMENT	
H-12	Establish Total Maximum Daily Loads (TMDLs)	Develop TMDLs for watersheds which have impaired stream segments present. TMDLs quantify the quantity of pollutants which can be assimilated in a waterbody; identifies sources; determines maximum amount of a pollutant allowed to enter a waterbody; and, determines a pollutant reduction target and allocates load reductions required for each pollutant source.	20	Immediate	1	Moderate	$$$	0.5	Teton County	TCD, Town of Jackson, WDEQ, USEPA
H-13	Streambank Stabilization/Restoration Projects	Implement additional streambank stabilization or restoration projects. Stabilization projects improve water quality by reducing sediment loading to streams. Restoration projects improve stream channels which have been altered from their natural state and provide additional habitat for aquatic species.	23	Long-Term	0	Long	$$$$$	0	Teton Conservation District	Trout Unlimited, Teton County, USGS
H-14	Implement Best Management Practices (BMP) at Riparian Areas	BMPs such as vegetative buffers near streams can improve water quality. Create a program to encourage implementation of BMPs near streams.	22	Short-Term	1	Short	$$	1	Teton County	Town of Jackson, Teton Conservation District
H-15	Construct Wetlands to Treat Irrigation Return Flows	Construct treatment wetlands which would intercept irrigation return flows and provide passive treatment before entering receiving streams.	17	Long-Term	2	Long	$$	0.5	Teton Conservation District	Teton County
H-16	Construct Vault Toilets @ Trailheads, River Access Sites	Many high use recreation areas do not have sanitary facilities. Construction of sanitary facilities, such as vault toilets would minimize potential impacts from human waste.	17	Immediate	2	Moderate	$$$	0	Teton County	Town of Jackson, WGFD, FWS, BLM, NFS
H-17	Establish Water Quality BMPs	Prepare a Teton County specific guidance document which identifies water quality BMPs for use by homeowner's, developers, agencies, etc.	18	Long-Term	2	Long	$$	0	Teton County	Teton Conservation District
H-18	Stormwater Treatment Unit Sludge Disposal	Identify stormwater treatment units which are not within the Town of Jackson; identify parties responsible for maintenance; and, identify facilities for disposal.	22	Short-Term	0	Short	$$	0	Teton County	Town of Jackson
H-19	Establish Illicit Discharge Program	Develop a countywide enforcement program to monitor for and eliminate illicit discharges such as RV dumping.	25	Immediate	1	Short	$$	1	Town of Jackson, Teton County	TCD, WDEQ

TABLE 5-7. LONG-TERM MITIGATION MEASURES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

APPENDIX	MITIGATION MEASURE	DESCRIPTION	RATING	NEED TIME FRAME	VOTES	IMPLEMENTATION TIME FRAME	RELATIVE COST	STAFF NEEDS	AGENCY INVOLVEMENT	
H-20	Construct Public Water Systems in County	Construct water supplies in areas of the county with higher development density such Kelly, Hoback, Alta. Note, Hoback Junction is already in the process of designing a public water system.	17	Long-Term	4	Long	$$$$	0	Teton County	Town of Jackson
H-21	Expand Existing Sewer Districts	Expand existing sewer districts to connect SWFs to systems which provide a higher level of treatment.	16	Long-Term	5	Long	$$$$$$$$	0.5	Teton County	Aspens-Pines, Teton Village
H-22	Create New Water & Sewer Districts (WSD) for Remote/Future Subdivisions	It is not feasible to serve certain areas of Teton County with existing water and sewer districts. New WSDs could be created in areas such as Kelly and Alta to provide water and wastewater treatment to outlying areas.	16	Long-Term	2	Long	$$$$$$$$	0	Teton County	TBD
H-23	Prioritize Water and Sewer District Formation Throughout the County	Identify areas in Teton County which would benefit from the creation of water and sewer districts. Districts would provide a single drinking water source and central wastewater treatment.	18	Long-Term	3	Long	$$$$$$$$	0	None	NA

TABLE 5-8. OTHER MITIGATION MEASURES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

NO.	MITIGATION MEASURE	DESCRIPTION	RATING	NEED TIME FRAME	VOTES	IMPLEMENTATION TIME FRAME	RELATIVE COST	STAFF NEEDS	AGENCY INVOLVEMENT	
H-24	Public Water Delivery	Deliver drinking water to areas with poor water quality to provide quality drinking water.	15	Long-Term	1	Short	$$	0	Teton County	NA
H-25	Increase Bank Shading Along Streams	Stream temperatures along Flat and Fish Creeks can exceed the maximum temperature ideal for aquatic species. Bank shading will help reduce surface water temperatures and improve conditions for aquatic species.	20	Long-Term	0	Long	$$$	0	Teton Conservation District	Teton County, Trout Unlimited, Snake River Fund
H-26	Flat Creek Sediment Reduction Project	Implement the Flat Creek Sediment Reduction project which will further reduce sediment loading in reaches of Flat Creek.	**This mitigation measures is incorporated into the Flat Creek Watershed Management Plan included in Mitigation Measure 19.**							
H-27	Expedite Remediation of Sites not Actively Remediating	There sites that are currently entered into, and actively remediating under, WDEQs Voluntary Remediation and Underground Storage Tank remediation programs. This action would determine how to expedite the remediation of sites that are not actively remediating.	16	Long-Term	0	Long	$$$$$$$	0	NA	NA
H-28	Conserve/Create New Wetlands	Wetlands support wildlife and serve as a means of natural treatment. Conserve existing wetlands and create new wetlands to provide additional treatment of stormwater runoff and wastewater effluent.	**This mitigation measures is incorporated into Mitigation Measure 13.**							
H-29	Acquire Instream Flow Water Rights	Buyback existing surface water rights to increase instream flows to protect the aquatic ecosystem.	**Not Evaluated - Removed from recommendations**							
H-30	Redirect Wilson Sewer District Flow	Redirect flows from the Wilson Sewer District to the Aspen Pines wastewater treatment plant from the Town of Jackson's treatment plant. This would provide additional capacity at the Town treatment plant for additional connections.	16	Long-Term	0	Long	$$$	0.5	Teton County	Aspens-Pines, Wilson Sewer District
H-31	Create Countywide Water and Sewer District	Consolidate existing water and sewer districts into a countywide water and sewer district. Management of drinking water treatment and distribution; and, of wastewater collection and treatment would be managed by the new district.	14	Long-Term	2	Long	$$$$$$$$$$	0	Teton County	Town of Jackson and existing districts
H-32	Stormwater Collection for Industrial Sites	Implement stormwater collection and treatment in industrial areas which will prevent downstream water quality.	**This mitigation measures is evaluated as part of Mitigation Measure 28, Stormwater Collection & Treatment.**							
H-33	Continuing Education Courses	Sponsor continuing education course focused on small wastewater facilities, stormwater best practices, and drinking water best practices for local technical professionals and developers	**This mitigation measures is not moved forward as continuing education is a requirement to maintain professional licensure.**							

TABLE 7-1. IMMEDIATE ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
ADDITIONAL STUDIES	Small Wastewater Facility Inventory/Audit	Teton County	NA	$ 100	$ 250	0.25	% Complete	Table 5-1, Item No. 1
	Water Resources Characterization	Teton County	TCD, USGS, WDEQ	$ 1,000	$ 1,500	1	% Complete	Table 5-1, Item No. 2
	Inventory Stormwater Systems & Identify Areas in Need of Stormwater Management	Teton County	Town of Jackson WDOT	$ 100	$ 250	Existing Staff	% Complete	Table 5-1, Item No. 5
	Identify Wastewater Treatment Options for Developed Areas in County	Teton County	Town of Jackson Aspens-Pines Teton Village	$ 250	$ 500	Existing Staff	% Complete	Table 5-1, Item No. 6
	Review Status of Transportation Safety, Emergency Response, and Chemical Application Programs	Teton County	Teton County Weed & Pest Teton County Emergency Management WYDOT	$ 100	$ 250	Existing Staff	% Complete	Table 5-1, Item No. 9
	Inventory Snow Storage Areas	Teton County	TCD Town of Jackson	$ 50	$ 75	0.25	% Complete	Table 5-1, Item No. 10
	Quantify Pollutants in Snow Storage Piles						% Complete	Table 5-1, Item No. 10
	Study Urban Impacts to Air and Snow						% Complete	Table 5-1, Item No. 10
	Evaluate Air Quality Impacts of Current Snow Removal Practices vs Snowmelt Systems						% Complete	Table 5-1, Item No. 10
	Evaluate WWTP Lagoons	Town of Jackson	Teton County	$ 50	$ 75	Existing Staff	% Complete	Table 5-5, Item No. H-10

TABLE 7-1. IMMEDIATE ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
EDUCATION	Source Water Protection	Teton County	TCD				# PWS contacted # Education Campaigns	Table 5-2, Item No. 1
	Benefits of Water Quality Protection Overlay	Teton County	TCD NGOs				# Residents contacted # Education Campaigns	Table 5-2, Item No. 3
	Water Resource Protection for Developers	Teton County	Town of Jackson TCD				# Developers attend training	Table 5-2, Item No. 4
	Well Owner Education on Source Water/Wellhead Protection	Teton County	TCD	$ 75	$ 125	0.5	# Residents contacted # Education Campaigns	Table 5-2, Item No. 5
	Small Wastewater Facility (SWF) Operation & Maintenance	Teton County	TCD					Table 5-2, Item No. 8
	Applications of Pesticides and Fertilizers	Teton County	TCD					Table5-2, Item No. 9
	Emerging Contaminant Education (PFAS, pesticides, E. coli)	Teton County	TCD					Table 5-2, Item No. 11

TABLE 7-1. IMMEDIATE ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
LAND DEVELOPMENT REGULATIONS	Develop Water Quality Protection Overlay (WQPO)	Teton County	TCD Town of Jackson	$ 25	$ 50	Existing Staff	% Completion	Appendix D-2 Appendix E-1 Table 5-3, Item No.4 Table 5-4, Item No. H-5
	Adopt water quality protections and BMPs	Teton County	TCD Town of Jackson	$ 25	$ 50	Existing Staff	% Completion	Appendix D-2
SMALL WASTEWATER FACILITY REGULATIONS	Adopt SWFR amendments for Operating Permits, Certified Service Providers, Treatment Standards in WQPO	Teton County	WDEQ TCD	$ 25	$ 50	2	% Completion	Appendix F
MONITORING	Implement Water Quality Monitoring Program	Teton County	TCD WDEQ USGS	$ 400	$ 600	0.5	% Completion Water Quality Improvement	Appendix G

TABLE 7-1. IMMEDIATE ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
GOVERNANCE AND POLICY	Formalize Future Wastewater Connection Program	Teton County Town of Jackson	NA	$ -	$ -	Existing Staff	Agreement Approved	Table 5-3, Item No. 1
	Create Local Groups/Teams to Implement WQMP	Teton County	Town of Jackson TCD NGOs	$ -	$ -	Existing Staff	Group Created	Table 5-3, Item No.2
	Septic System Replacement/Connection Program	Teton County	Town of Jackson TCD Aspens-Pines	$ 1,000	$ 2,000	Existing Staff	Program Created # Participants	Table 5-3, Item No.3
	County Ownership of Sewer Extensions	Teton County	Town of Jackson	$ 2,500	$ 4,000	1	# of Sewer Extensions # of Connections	Table 5-4, Item No. H-4

TABLE 7-1. IMMEDIATE ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
MITIGATION MEASURES	Source Water Protection Planning (SWPP)	Teton County	PWSs WDEQ WARWS	$ 100	$ 250	0.5	# of PWSs that complete SWAs and SWPPs	Table 5-4, Item No. H-2
	Construct RV Dump Station	Teton County	Town of Jackson	$ 1,500	$ 2,000	Existing Staff	% Completion # Users	Table 5-4, Item No. H-3
	Implement Recommendations from Other Plans	Teton County	Town of Jackson TCD	$ -	$ -	Existing Staff	# Implemented	Table 5-4, Item No. H-6
	Biosolids Reuse/Disposal	Town of Jackson ISWR	Town of Jackson	$ 25	$ 50	Existing Staff	% Completion Tons Used for Compost	Table 5-4, Item No. H-7
	Implement Fish Creek WMP	TCD	Teton County Town of Jackson WDEQ	$ 250	$ 500	Existing Staff	Reduction in E.coli and nutrients Removal from impaired list	Table 5-4, Item No. H-8
	Implement Town of Jackson Stormwater Management Program	Town of Jackson	TCD Teton County Snake River Fund	$ 750	$ 1,500	Existing Staff	# Practices Implemented	Table 5-4, Item No. H-9
	Increase High School Road Sewer Trunk Line Capacity	Town of Jackson	-	$ 1,000	$ 1,500	Existing Staff	% Completion	Appendix E-2
	Continue Implementation of In-line Stormwater Treatment or Green Infrastructure in Town	Town of Jackson	TCD Teton County Snake River Fund	$ 750	$ 1,000	Existing Staff	# of Projects Completed	Table 5-5, Item No. H-11

Abbreviations:
NA = Not Applicable
NGO = Non-Governmental Organization
PWS = Public Water Supply
TCD = Teton Conservation District
USGS = United States Geological Survey
WARWS = Wyoming Association of Rural Water Systems
WDEQ = Wyoming Department of Environmental Quality
WWTP = Wastewater Treatment Plant
WYDOT=Wyoming Department of Transportation

TABLE 7-2. SHORT-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
ADDITIONAL STUDIES	Infrastructure Inventory & Operational Database	Teton County	TCD	$ 100	$ 250	0.25	% Complete	Table 5-1, Item No. 3
	Inventory Public and Private Water Supplies	Teton County	TCD	$ 50	$ 100		% Complete	Table 5-1, Item No. 3
	Evaluate Stormwater Treatment Feasibility	Teton County Town of Jackson	TCD	$ 50	$ 100	Existing Staff	% Complete	Table 5-1, Item No. 7
	Evaluate Feasibility of Greywater and Treated Effluent Reuse	Teton County	Town of Jackson	$ 100	$ 150	0.25 County 0.25 Town	% Complete	Table 5-1, Item No. 11
EDUCATION	Voluntary Public Water Supply and Private Well Testing	Teton County	TCD	$ 25	$ 50	Existing staff	# Residents contacted # Education Campaigns	Table 5-2, Item No. 2
	Native Landscaping	Teton County	TCD			Existing staff		Table 5-2, Item No. 12
	Benefits of Stream Buffers	Teton County	TCD			Existing staff		Table 5-2, Item No. 13
	Snow Storage Best Practices	Teton County	TCD			Existing staff		Table 5-2, Item No. 14
	Treatment Wetlands	Teton County	TCD			Existing staff		Table 5-2, Item No. 17
	Agricultural BMPs	Teton County	TCD			Existing staff		Table 5-2, Item No. 19
LAND DEVELOPMENT REGULATIONS	Establish Total Maximum Daily Loads (TMDLs)	Teton County	TCD WDEQ Town of Jackson USEPA	$ 350	$ 500	0.5	% Complete	Table 5-6, Item No. H-12
	Implement WQPO	Teton County	NA	$ 25	$ 50	Existing Staff	% Complete	Appendix D-2 Appendix E-1 Table 5-3, Item No.4 Table 6-4, Item No. H-5
	Establish Water Quality BMPs	Teton County	TCD	$ 50	$ 100	Existing Staff	% Complete	Table 5-6, Item No. H-17

TABLE 7-2. SHORT-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
SMALL WASTEWATER FACILITY REGULATIONS	Create Certification Program for Service Providers	Teton County	WDEQ	$ 25	$ 50	0.25	% Complete	Appendix F
	Implement Operating Permits	Teton County	NA	$ 125	$ 200	0.25	# Operating Permits Issued	Appendix F
	New and Replacement SWFs or Connect to Sewer	Teton County	Town of Jackson Aspens-Pines	$ 2,500	$ 5,000	0.25	# Replaced #Connected	Appendix F
MONITORING	Continue to Implement Water Quality Monitoring Plan Amend Plan Schedule and Analysis Parameters	Teton County	TCD WDEQ USGS	$ 200	$ 400	0.25	% Complete	Appendix G
GOVERNANCE AND POLICY	Require public water supplies (PWSs) to Submit Consumer Confidence Reports (CCRs) to Teton County	Teton County	PWSs	$ 10	$ 25	Existing Staff	% PWS who submit CCRs	Table 5-3, Item No. 8
	Establish Illicit Discharge Program	Town of Jackson Teton County	TCD WDEQ	$ 75	$ 150	1	# Citations Issued per Year	Table 5-6, Item No. H-19

TABLE 7-2. SHORT-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	AGENCY INVOLVEMENT		ESTIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
MITIGATION MEASURES	Streambank Stabilization/Restoration Projects	TCD	Teton County Trout Unlimited USGS	$ 750	$ 1,250	Existing Staff	# Projects Completed per Year # Miles Stabilized or Restored	Table 5-6, Item No. H-13
	Implement BMPs at Riparian Areas	Teton County	TCD Town of Jackson	$ 100	$ 250	Existing Staff	# Projects Completed per Year	Table 5-6, Item No. H-14
	Construct Wetlands to Treat Irrigation Return Flows	TCD	Teton County	$ 100	$ 250	Existing Staff	Acres of Wetlands Constructed per Year	Table 5-6, Item No. H-15
	Construct Vault Toilets @ Trailheads, River Access Sites	Teton County	Town of Jackson WGDF USFWS BLM NFS	$ 500	$ 1,000	Existing Staff	# Vault Toilets Constructed per Year	Table 5-6, Item No. H-16
	Stormwater Treatment Unit Sludge Disposal	Teton County	Town of Jackson	$ 100	$ 250	Existing Staff	# of STUs Cleaned per Year	Table 5-6, Item No. H-18

Abbreviations:

BLM = Bureau of Land Management
NA = Not Applicable
NFS = National Forest Service
NGO = Non-Governmental Organization
PWS = Public Water Supply
TCD = Teton Conservation District
USEPA = United States Environmental Protection Agency
USFWS = United States Fish and Wildlife Service
USGS = United States Geologic Survey
WARWS = Wyoming Association of Rural Water Systems
WDEQ = Wyoming Department of Environmental Quality
WGFD = Wyoming Game and Fish Department
WWTP = Wastewater Treatment Plant
WYDOT=Wyoming Department of Transportation

TABLE 7-3. LONG-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

ACTION GROUP	NAME	AGENCY INVOLVEMENT		ESIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
ADDITIONAL STUDIES	Evaluate Wetland Banking Challenges	Teton County	USEPA USACOE USFWS WDEQ NGOs	$ 100	$ 250	0	% Complete	Table 5-1, Item No. 8
EDUCATION	Water Reuse/Conservation	Teton County	TCD NGOs	$ 10	$ 20	Existing	# Residents contacted	Table 5-2, Item No. 10
	Water Conservation Best Practices	Teton County	TCD NGOs					Table 5-2, Item No. 16
LAND DEVELOPMENT REGULATIONS	Implement Total Maximum Daily Loads (TMDLs)	Teton County	TCD WDEQ Town of Jackson USEPA	$ 200	$ 350	0.5	% Complete	Table 5-6, Item No. H-12
	Implement WQPO	Teton County	NA	$ 75	$ 100	Existing	% Complete	Appendix D-2 Appendix E-1 Table 5-3, Item No.4 Table 6-4, Item No. H-5

TABLE 7-3. LONG-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

ACTION GROUP	NAME	AGENCY INVOLVEMENT		ESIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
SMALL WASTEWATER FACILITY REGULATIONS	Implement Certification Program for Service Providers	Teton County	WDEQ	$ 25	$ 50	0.25	% Complete	Appendix F
	Implement Operating Permits	Teton County	NA	$ 50	$ 75	0.25	# Operating Permits Issued	Appendix F
	New and Replacement SWF connect to Sewer/Install Treatment	Teton County	Town of Jackson Aspens-Pines	$ 12,500	$ 20,000	1	# Replaced # Connected	Appendix F
MONITORING	Continue to Implement Water Quality Monitoring Plan Amend Plan Schedule and Analysis Parameters	Teton County	TCD WDEQ USGS	$ 200	$ 400	0.25	% Complete Water Quality Improvement	Appendix G
GOVERNANCE AND POLICY	Create Stormwater Utility	Teton County	Town of Jackson Special Districts	$ 2,000	$ 3,000	Existing	% Complete	Table 5-3, Item No. 5
	Responsible Management Entity (RME) for SWFs	Teton County	TCD			Existing	% Complete	Table 5-3, Item No. 6
	Establish Water Conservation Goals	Teton County	Town of Jackson TCD NGOs	$ 25	$ 50	Existing	% Complete	Table 5-3, Item No. 7

TABLE 7-3. LONG-TERM ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

ACTION GROUP	NAME	AGENCY INVOLVEMENT		ESIMATED COST		STAFFING NEEDS	METRIC	REFERENCE
		LEAD	SUPPORT	LOW	HIGH			
				$1,000's		FTE		
MITIGATION MEASURES	Construct Public Water Systems in County	Teton County	Town of Jackson	$ 500	$ 750	Existing	% Complete	Table 5-7, Item No. H-20
	Expand Existing Sewer Districts	Teton County	Aspens-Pines Teton Village	$ 1,000	$ 4,000	Existing	# of Connection to Sewer per Year	Table 5-7, Item No. H-21
	Create New Water & Sewer Districts (WSD) for Remote/Future Subdivisions	Teton County	TBD	$ 1,000	$ 4,000	Existing	# New WSD Created # Connections	Table 5-7, Item No. H-22
	Prioritize Water and Sewer District Formation Throughout the County	Residents	Teton County	$ 50	$ 150	Existing	# New WSD Created # Connections	Table 5-7, Item No. H-23

Abbreviations:

NA = Not Applicable
NGO = Non-Governmental Organization
TBD = To Be Determined
TCD = Teton Conservation District
USACOE = United States Army Corps of Engineers
USEPA = United States Environmental Protection Agency
USFWS = United States Fish and Wildlife Service
USGS = United States Geological Survey
WDEQ = Wyoming Department of Environmental Quality
WSD = Water & Sewer District

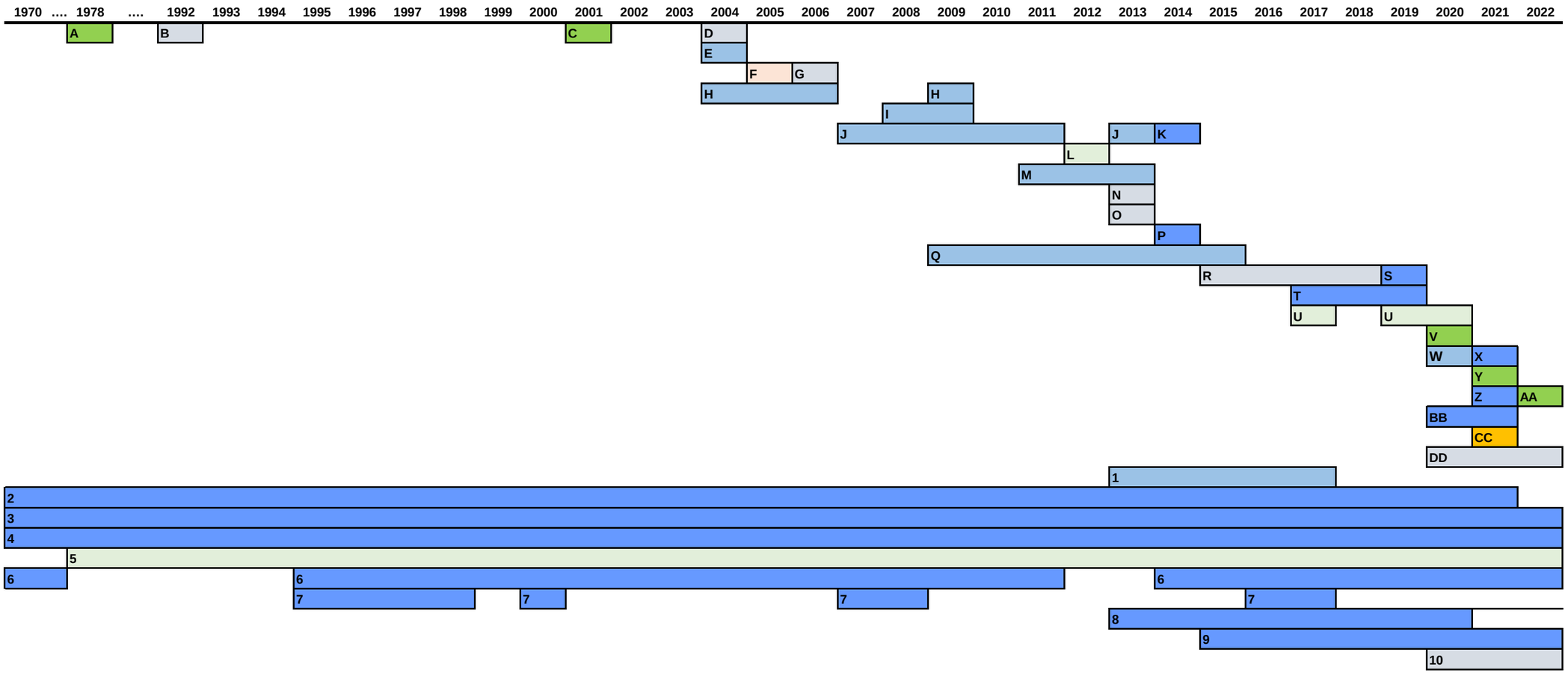
TABLE 7-4. OTHER ACTIONS
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

WQA CATEGORY	NAME	EXPLANATION FOR NOT RECOMMENDING MITIGATION MEASURE AT THIS TIME	REFERENCE
ADDITIONAL STUDIES	Verify Membrane Wastewater Treatment Systems Provide Temperature Regulation	Wastewater treatement systems utilizing this technology are required to monitor and report effluent quality as part of their WYPDES discharge permit requirements. It is known that membrane wastewater treatement technologies are not as effective during the winter months.	Table 5-1, Item No. 4
EDUCATION	Recreational Water Use	There was not support among the stakeholders to move this campaign forward.	Table 5-2, Item No. 16
	Beneficial Reuse of Manure	There was not support among the stakeholders to move this campaign forward.	Table 5-2, Item No. 18
GOVERNANCE AND POLICY	Create Regional Wastewater Authority	This measure is not needed and would not provide addiitional benefit to residents.	Table 5-3. Item No.1
MITIGATION MEASURES	Public Water Delivery	Water supplies are currently suitable for household use and more cost effective solutions are available, if needed.	Table 5-8, Item No. H-24
	Increase Bank Shading Along Streams	Bank shading can be incorporated into restoration and stabilization projects and is not recommended as a standalone measure.	Table 5-8, Item No. H-25
	Flat Creek Sediment Reduction Project	Already being addressed by the Flat Creek WMP.	Table 5-8, Item No. H-26
	Expedite Remediation of Sites not Actively Remediating	Remediation of VRP and LUST sites are under the jurisdiction of WDEQ.	Table 5-8, Item No. H-27
	Conserve/Create New Wetlands	This mitigation measures is incorporated into Mitigation Measure 13.	Table 5-8, Item No. H-28
	Acquire Instream Flow Water Rights	This measure was removed from consideration and not evaluated.	Table 5-8, Item No. H-29
	Redirect Wilson Sewer District Flow	This measure was previously studied and there was strong oposition to this proposal.	Table 5-8, Item No. H-30
	Create Countywide Water and Sewer District	This measure is not needed and would not provide addiitional benefit to residents.	Table 5-8, Item No. H-31
	Stormwater Collection for Industrial Sites	This mitigation measure is evaluated as part of Mitigation Measure 28, Stormwater Collection & Treatment.	Table 5-8, Item No. H-32
	Continuing Education Courses	This mitigation measures is not recommended because continuing education is already a requirement to maintain professional licensure.	Table 5-8, Item No. H-33

Abbreviations:
LUST = Leaking Underground Storage Tanks
VRP = Voluntary Remediation Program
WDEQ = Wyoming Department of Environmental Quality
WMP = Watershed Management Plan
WYPDES = Wyoming Pollutant Discharge Elimination System

FIGURES

FIGURE 3-1. HARD COPY REPORT AND ELECTRONIC WATER QUALITY DATA TIMELINE
TETON COUNTY WQMP
TETON COUNTY, WYOMING



ELECTRONIC DATA SETS

1. USGS Characterization of Water Quality and Biological Communities, Fish Creek, Wy, 2013-2017.
2. EPA-PWS- Bacteria Data; https://www.epa.gov/waterdata/water-quality-data-download#portal
3. EPA-PWS-Chemistry Data: https://www.epa.gov/waterdata/water-quality-data-download#portal
4. National Water Quality Monitoring Council Data (1973 – 2022): https://www.waterqualitydata.us/
5. Wyoming DEQ Underground Injection Control Program Data for Teton County, 1978-2022
6. Teton County Conservation District-Surface- Water Chemistry Database, 1973 - 2022
7. Teton County Conservation District-Surface Biological Monitoring Database, 1995-2017
8. Teton Conservation District Voluntary Well Test Kit Monitoring Data, 2013 - 2020
9. Teton Conservation District - Flat Creek Temperature Data, 2015-2022
10. Teton Conservation District: Septic Effluent Database 2019 - 2022

EXPLANATION

- University of Wyoming
- USGS
- Town and County
- WDEQ
- SEO
- Consultant
- Other

FIGURE 3-1. HARD COPY REPORT AND ELECTRONIC WATER QUALITY DATA TIMELINE
TETON COUNTY WQMP
TETON COUNTY, WYOMING

HARD COPY REPORTS (TITLE, YEAR)

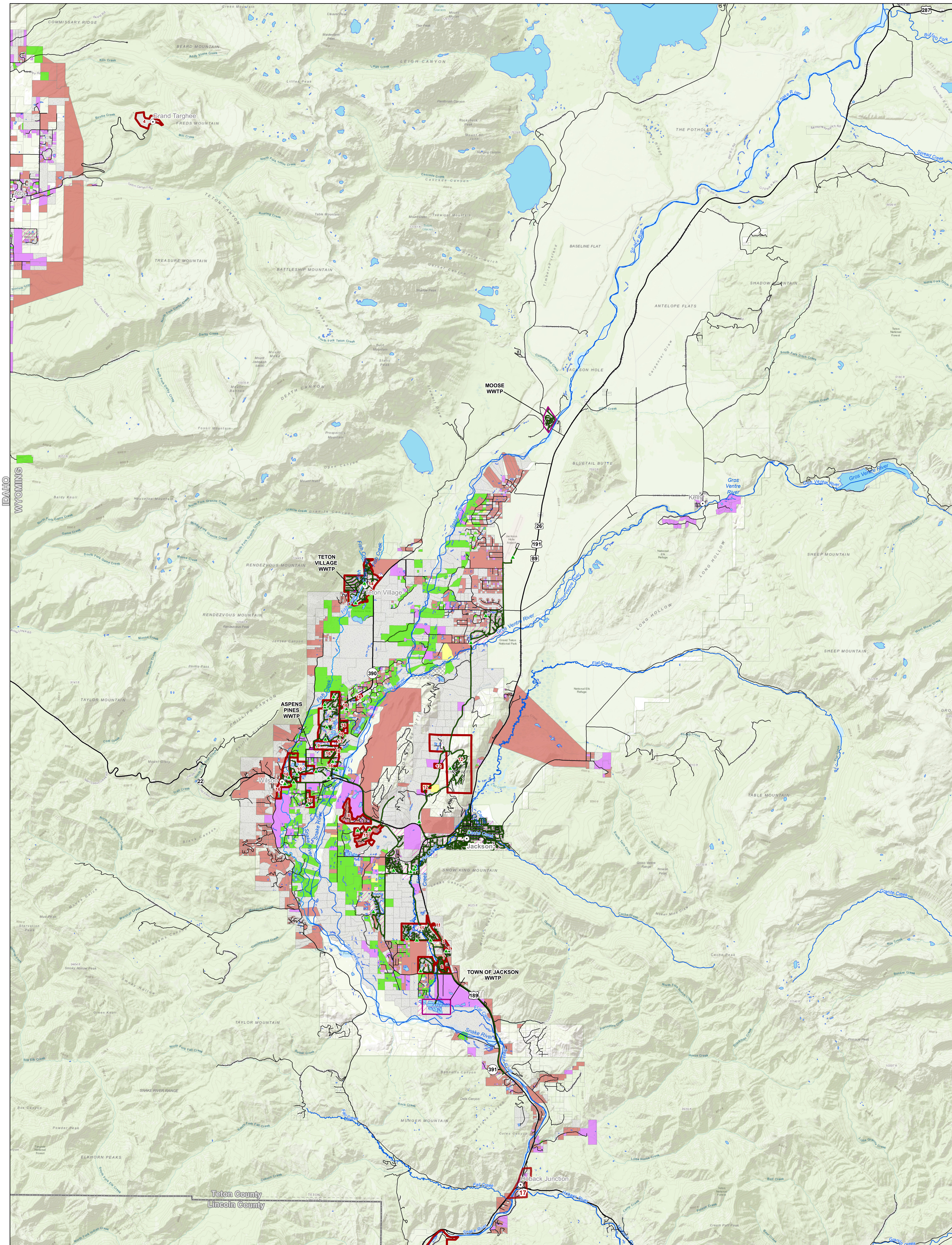
A. Teton County Water Quality Management Program, 1978
B. Teton County Westbank Groundwater Study, 1992
C. Surface Water Drainage Infrastructure Master Plan, 2001
D. Wyoming Department of Environmental Quality Source Water Assessment Project, Final Project Report, 2004
E. Seepage Investigation on Selected Reaches of Fish Creek, Teton County, Wyoming, 2004
F. West Bank Snake River Hydrology Study, May 2005
G. Hoback Junction Water Supply Study, Level I Final Report, March 2006
H. Characterizations of Interactions between Surface Water and Near-Stream Groundwater Along Fish Creek, Teton County, Wyoming, by Using Heat as a Tracer, 2009
I. Hydrogeology and Water Quality in the Snake River Alluvial Aquifer at Jackson Hole Airport, Jackson, WY, September 2008-June 2009
J. Characterization of Water Quality and Biological Communities, Fish Creek, Teton County, Wyoming, 2007-2011, 2013
K. 2012 Snake/Salt River Basin Plan Update, November 2014
L. WDEQ WQD Chapter 23: Minimum Standards for Subdivision Application, July 2012
M. Hydrogeology and Water Quality in the Snake River Alluvial Aquifer at Jackson Hole Airport, Jackson, WY, Water Years 2011 and 2012, 2013
N. Teton County Vegetation and Non-Vegetation Cover Type Mapping Final Report, December 2013
O. Report to Crescent H Stream and Trail Committee - Assessments of Fish Creek, Teton County Wyoming and their Implication for Management and Restoration Efforts, December 2013
P. Snake/Salt River Basin Water Plan Update Groundwater Study, Available Groundwtaer Determination Technical Memorandum No. 7, 2014
Q. Estimated Nitrogen and Phosphorus Inputs to the Fish Creek Watershed, Teton County, Wyoming, 2009-2015
R. Wastewater System Mapping Project, 2018
S. Flat Creek Watershed Management Plan, 2019 Revision
T. Teton Conservation District Septic System Inspections, 2017-2019
U. Wyoming's 2020 Integrated 305(b) and 303(d) Report-Final, 2020
V. Jackson-Teton County Comprehensive Plan, Updated November 2, 2020.
W. Discharge and Dissolved-Solids Characteristics and Trends of Snake River Above Jackson Lake at Flagg Ranch, Wyoming, 2020
X. Drinking Water Quality Mapping Project, January 20, 2021
Y. Teton County Land Development Regulations, Updated May 3, 2021
Z. Greater Yellowstone Climate Assessment, June 2021
AA. Small Wastewater Facility Regulations, January 1, 2022
BB. Jackson Hole Airport PFAS Investigation Reports
CC. Understanding Contributions of Fecal Bacteria Sources in Wyoming Rivers to Inform Pollution Management, August 2022
DD. Teton County Septic System Effluent Monitoring Report, August 2022

REPORTS PENDING

* WDEQ Hoback Junction Groundwater Investigation (not shown)

NOTES:

1. Electronic data set 3 contains extensive surface and groundwater monitoring locations. However, water quality data sets for individual monitoring locations are limited in time and water quality parameters.



EXPLANATION

LIFT STATION
SANITARY SEWER LINE
DISTRICT BOUNDARY
PARCEL

WASTEWATER TREATMENT TYPE

ADVANCED TREATMENT (7)
MULTIPLE TYPES (16)
PUBLIC (8,935)
BURIED LEACHFIELD (1,576)
RAISED LEACHFIELD (545)
UNKNOWN (536)
VACANT LOT, UNDEVELOPED (1,429)

N

0 7,500 15,000 '

NOTE:

FEDERAL LANDS ARE SHOWN IN FADED AREAS.

WASTEWATER DISTRICT:

1.....SNAKE RIVER SPORTING CLUB ISD
2.....SOUTH PARK SERVICE CENTER ISD
3.....RIDGELINE ISD
4.....GRAND TARGHEE RESORT
5.....ASPEN PINES WATER AND SEWER
6.....MELODY RANCH ISD
7.....O BAR B ISD
8.....SKYLINE ISD
9.....WILLOWBROOK WATER AND SEWER
10...FISH CREEK ISD
11...RAFTER J ISD
12...SPRING CREEK ISD
13...VILLAGE ROAD ISD
14...TETON VILLAGE WATER AND SEWER
15...INDIAN SPRINGS RANCH HOA (FUTURE)
16...WILSON SEWER DISTRICT
17...HOBACK JUNCTION WATER AND SEWER

ISD = IMPROVEMENT AND SERVICE DISTRICT

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-1

SANITARY SEWER LINES AND WASTEWATER TREATMENT FACILITIES

WATER QUALITY MASTER PLAN TETON COUNTY, WYOMING

Drawn By: AML	Checked By: TE	Scale: 1 " = 7,500 '	Date: 11/15/23	File: Fig4-1_SewerLine_WWTP.mxd

IDAHO
WYOMING

Spread Creek
Gros Ventre River
191
89
26
390
22
Fish Creek
Flat Creek
Cache Creek
Granite Creek
Flat Creek
391
189
Fall Creek
Hoback River
Hoback River
Willow Creek
26
89
189
191
Teton County
Lincoln County

EXPLANATION

- STATE/FEDERAL HIGHWAY
- COUNTY ROAD
- SNOW STORAGE
- NATIONAL ELK REFUGE
- WGFD FEED GROUNDS
- SHOOTING RANGE
- DEVELOPED IMPERVIOUS AREAS
- AGRICULTURAL LANDS

NOTES:

WGFD - WYOMING GAME AND FISH DEPARTMENT

N

0 15,000 '

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

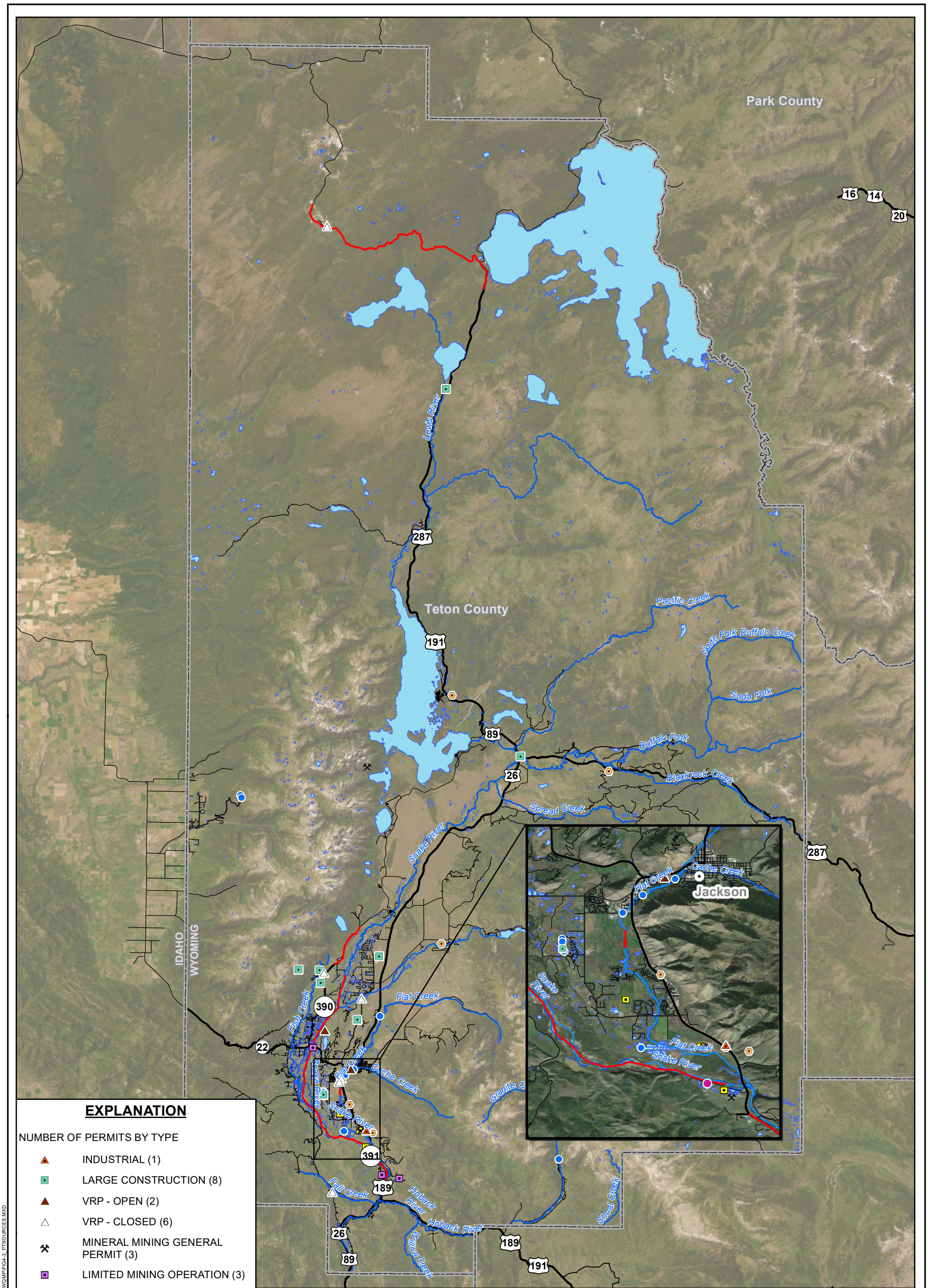
FIGURE 4-2

NONPOINT SOURCE STORMWATER DISCHARGE

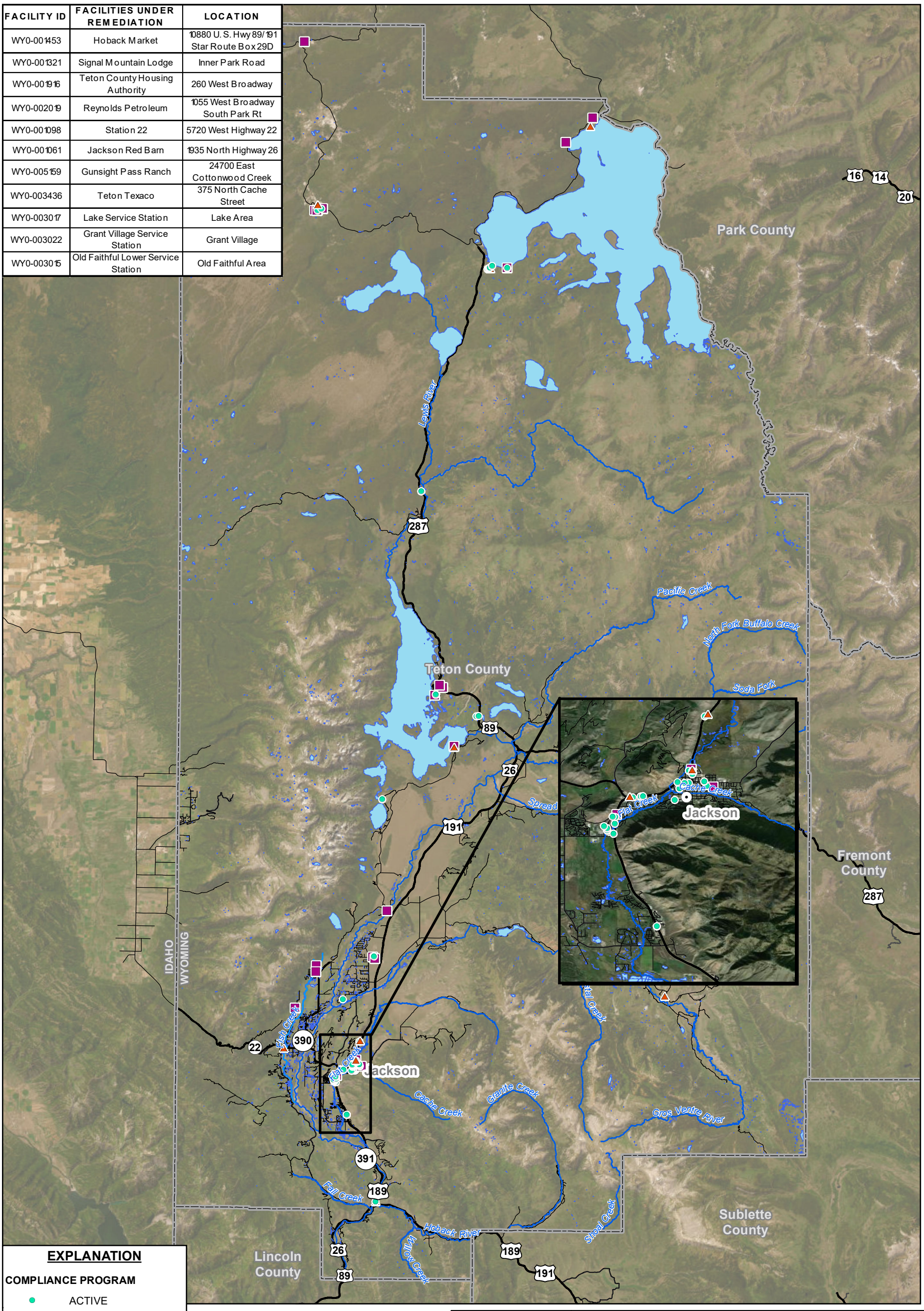
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

Drawn By: AML	Checked By: TE	Scale: 1 " = 15,000 '	Date: 11/15/23	File: Fig4-2_NonPt_Source.mxd

M:\STOV\TETON\CNTY\GIS\MAPPING\REPORT_FIGURES\WQMP\FIG4-2_NONPT_SOURCE.MXD


Park County
Teton County
IDAHO
WYOMING
Lewis River
Pacific Creek
North Fork Buffalo Creek
Soda Fork
Buffalo Fork
Blackrock Creek
Spread Creek
Snake River
Flat Creek
Fish Creek
Cache Creek
Granite C
Fall Creek
Hoback River
Willow Creek
Shoal Creek
Jackson
16
14
20
287
191
89
26
390
391
189
22
EXPLANATION
NUMBER OF PERMITS BY TYPE
INDUSTRIAL (1)
LARGE CONSTRUCTION (8)
VRP - OPEN (2)
VRP - CLOSED (6)
MINERAL MINING GENERAL PERMIT (3)
LIMITED MINING OPERATION (3)
SMALL MINING OPERATION (3)
SOLID WASTE FACILITY (6)
WYPDES OUTFALL (12)
LARGE CONSTRUCTION (5)
NOTES:
VRP - VOLUNTARY REMEDIATION PROGRAM
WYPDES - WYOMING POLLUTANT DISCHARGE ELIMINATION SYSTEM
N
0
40,000 '
Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729
FIGURE 4-3
POINT SOURCES
WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING
Drawn By: AML
Checked By: TE
Scale: 1 " = 40,000 '
Date: 11/15/23
File: Fig4-3_PtSources.mxd
M:\ST\OVIT\ETONCNTY\GIS\MAPPING\REPORT_FIGURES\WQMP\FIG4-3_PTSOURCES.MXD

FACILITY ID	FACILITIES UNDER REMEDIATION	LOCATION
WY0-001453	Hoback Market	10880 U. S. Hwy 89/191 Star Route Box 29D
WY0-001321	Signal Mountain Lodge	Inner Park Road
WY0-001916	Teton County Housing Authority	260 West Broadway
WY0-002019	Reynolds Petroleum	1055 West Broadway South Park Rt
WY0-001098	Station 22	5720 West Highway 22
WY0-001061	Jackson Red Barn	1935 North Highway 26
WY0-005159	Gunsight Pass Ranch	24700 East Cottonwood Creek
WY0-003436	Teton Texaco	375 North Cache Street
WY0-003017	Lake Service Station	Lake Area
WY0-003022	Grant Village Service Station	Grant Village
WY0-003015	Old Faithful Lower Service Station	Old Faithful Area



EXPLANATION

COMPLIANCE PROGRAM

- ACTIVE

REMEDIATION PROGRAM

- UNDER REMEDIATION
- CLOSED

NOTE:

WDEQ=WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

N

0 40,000'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-4

WDEQ STORAGE TANK PROGRAM FACILITIES

WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

Drawn By: AML	Checked By: TE	Scale: 1 " = 40,000 '	Date: 11/15/23	File: Fig4-4_WDEQ_Facilities.mxd

M:\ST\OVIT\ETON\CNTY\GIS\MAPPING\REPORT_FIGURES\WQMP\FIG4-4_WDEQ_FACILITIES.MXD

	SYSTEM NAME
1	Town of Jackson
2	Teton Village
3	Rafter J Ranch Subdivision
4	Aspens Pines
5	Melody Ranch Subdivision
6	Spring Creek Ranch Subdivision
7	Jackson Hole Golf and Tennis
8	Gros Ventre North Subdivisions
9	Gros Ventre West/Bar Y
10	Skyline Ranch
11	Indian Paintbrush
12	Squaw Creek
13	Teton Shadows Condominiums
14	Rivermeadows Subdivision
15	Evans Trailer Park
16	Bar-B-Bar Subdivision
17	Saddle Butte Tracts
18	South Park Village
19	High Country Subdivision
20	Millward Trailer Park
21	Highland Park Subdivision
22	Indian Springs Subdivision
23	J-W Subdivision
24	Little Horsethief Canyon Subdivision
25	Snake River Mobile Home Park
26	C-V School for Disabled Youth
27	Alta Community Pipeline
28	Grand Targhee Resort
29	Targhee Town Water Co., Inc.
30	Wilson Meadows
31	Targhee Village
101	Wilson School
102	Kelly School
103	Fish Creek Inn
104	Teton Gables
105	Stage Coach Bar - Patticake
106	Steak Pub Restaurant
108	Camp Creek Inn
109	Horse Creek Station
110	Pearl Street Bagels (Wilson)
111	Jackson Hole Maverick
112	Balsam Route Store
113	Point Store
114	Calico Pizza
115	Dornan's (Moose)
116	Vista Grande
117	Bar J Chuckwagon
119	Trails End Ranch
120	Gros Ventre River Ranch
121	Crescent H Guest Ranch
123	Split Creek Ranch
124	Trail Creek
125	R Lazy S
126	Snake River Park
127	Teton Village KOA
128	Teton Valley Ranch Camp
129	Spotted Horse Ranch
131	Camp Davis
132	Astoria Hot Springs
133	Teton High Adventure Base
134	Lazy J Corral
135	Lone Eagle Ranch
136	Vigrinian Motel Campground
137	Flat Creek Motel
138	Hoback River Resort
139	Elk Refuge Inn
140	Old West Cabins
141	Mad Dog Guest Ranch
142	LVPL Office
143	J Bar H Ice Company
144	National Wildlife Art Museum
145	WYDOT Maintenance Shop
146	Red Top Treatment Center
147	USFS Dog Creek Work Camp
148	USFWS National Fish Hatchery
149	Jackson Hole Airport
150	Otto Brothers Brewing
151	Alta School
152	Lost Horizons
153	Casper Mountain Lodge

Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS

EXPLANATION

- COMMUNITY SYSTEM
- NON-COMMUNITY SYSTEM
- TRANSIENT NON-COMMUNITY
- NON-TRANSIENT NON-COMMUNITY

N

0 15,000'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

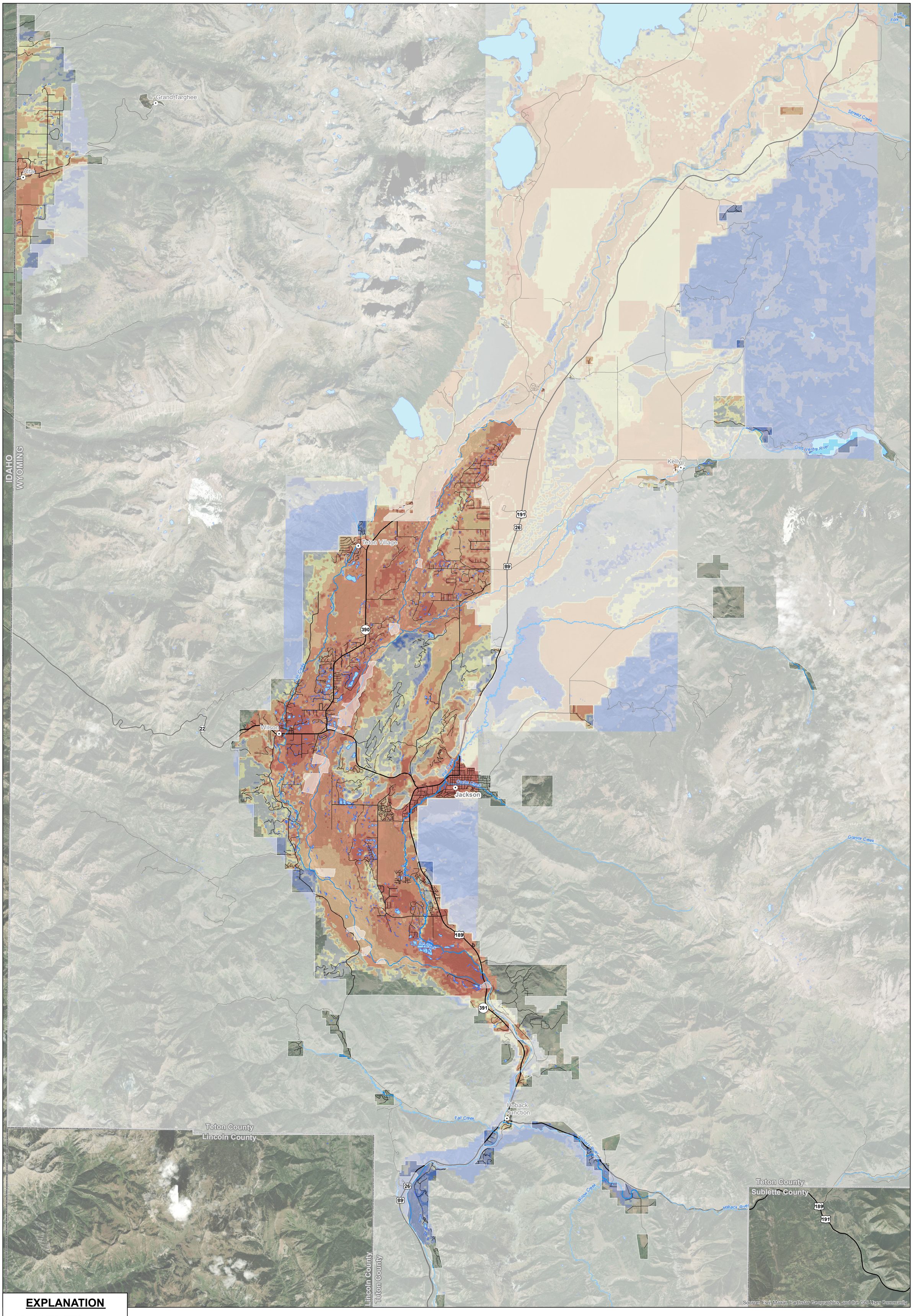
FIGURE 4-5

TETON COUNTY PUBLIC WATER SYSTEMS

WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

Drawn By: AML	Checked By: BS	Scale: 1 " = 15,000 '	Date: 11/15/23	File: Fig4-5_PWS.mxd

M:\ST\OVT\ETON\CNTY\GIS\MAPPING\REPORT_FIGURES\WQMP\Fig4-5_PWS.MXD



EXPLANATION

VULNERABILITY RATING

- VERY LOW (18-34)
- LOW (34-44)
- MODERATELY LOW (44-53)
- MODERATE (53-58)
- MODERATELY HIGH (58-64)
- HIGH (64-72)
- VERY HIGH (72-94)

NOTE:

PERCENTAGE OF PRIVATE LAND BY VULNERABILITY RATING:

VERY LOW.....1%
LOW.....6%
MODERATELY LOW.....16%
MODERATE.....11%
MODERATELY HIGH.....28%
HIGH.....29%
VERY HIGH.....9%

FEDERAL LANDS ARE SHOWN IN FADED AREAS.

N

0 7,500 15,000 '

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-6

AQUIFER VULNERABILITY RATING

WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

Drawn By: AML	Checked By:TE	Scale: 1 " = 7,500 '	Date: 11/15/23	File: Fig4_6_AVR.mxd

M:\STO\VT\ETONCNTY\GIS\MAPPING\REPORT_FIGURES\WQMP\FIG4_6_AVR.MXD

SOUTH LEIGH CREEK
DRY CREEK
WOODS CREEK-TETON RIVER
TETON CREEK
HILL CREEK-SPRING CREEK
COTTONWOOD CREEK
ELK RANCH RESERVOIR-SNAKE RIVER
ELK RANCH RESERVOIR-SNAKE RIVER
DITCH CREEK
DITCH CREEK
DITCH CREEK
DITCH CREEK
DITCH CREEK
DITCH CREEK
DITCH CREEK
STEWART DRAW-SNAKE RIVER
STEWART DRAW-SNAKE RIVER
STEWART DRAW-SNAKE RIVER
BIERER CREEK-GROS VENTRE RIVER
BIERER CREEK-GROS VENTRE RIVER
BIERER CREEK-GROS VENTRE RIVER
BIERER CREEK-GROS VENTRE RIVER
BIERER CREEK-GROS VENTRE RIVER
LAKE CREEK
LAKE CREEK
FISH CREEK
MIDDLE FLAT CREEK
NOWLIN CREEK
MIDDLE FLAT CREEK
CACHE CREEK
SPRING CREEK-SNAKE RIVER
LOWER FLAT CREEK
MOSQUITO CREEK
PORCUPINE CREEK-SNAKE RIVER
PORCUPINE CREEK-SNAKE RIVER
PORCUPINE CREEK-SNAKE RIVER
HORSE CREEK
PORCUPINE CREEK-SNAKE RIVER
PORCUPINE CREEK-SNAKE RIVER
POISON CREEK-HOBACK RIVER
FALL CREEK
POISON CREEK-HOBACK RIVER
PORCUPINE CREEK-SNAKE RIVER
PORCUPINE CREEK-SNAKE RIVER
Grand Targhee
Alta
Teton Village
Wilson
Jackson
Hoback Junction
Kelly
IDAHO
WYOMING
Teton County
Lincoln County
Teton County
Lincoln County
Teton County
Sublette County
Lincoln County
Sublette County
Source: Esri, Maxar, TerraStar, Geographics, and the GIS User Community

EXPLANATION

HUC 12 ON NON-FEDERAL LANDS WITHIN DOMAIN

VULNERABILITY RATING

- VERY LOW (3-14)
- LOW (14-19)
- MODERATE (19-24)
- HIGH (24-30)
- VERY HIGH (30-51)

HUC 12 WATERSHED	% OF NON-FEDERAL LAND IN MODEL DOMAIN RATED "VERY HIGH" *
LOWER FLAT CREEK	16.5%
LAKE CREEK	2.8%
SPRING CREEK-SNAKE RIVER	2.9%
FISH CREEK	15.8%
TETON CREEK	43.9%
PORCUPINE CREEK-SNAKE RIVER	0.0%
MIDDLE FLAT CREEK	16.0%
CACHE CREEK	75.6%
WOODS CREEK-TETON RIVER	33.5%
DRY CREEK	0.0%
POISON CREEK-HOBACK RIVER	0.2%
STEWART DRAW-SNAKE RIVER	0.1%
BIERER CREEK-GROS VENTRE RIVER	0.4%

NOTE:

-FEDERAL LANDS ARE SHOWN IN FADED AREAS.
-HUC=U.S. GEOLOGICAL SURVEY HYDROLOGIC UNIT CODE
* REPRESENTS NON-REDERAL LANDS WITHIN EACH WATERSHED RATED "VERY HIGH" AS A PERCENTAGE OF THE TOTAL WATERSHED AREA WITHIN THE MODEL DOMAIN.

N

0 7,250 14,500 '

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-7

SURFACE WATER VULNERABILITY

WATER QUALITY MASTER PLAN
TETON COUNTY, WYOMING

Drawn By: AML	Checked By: CR	Scale: 1 " = 7,250 '	Date: 11/15/23	File: Fig4_7_SW_Vulnerability.mxd